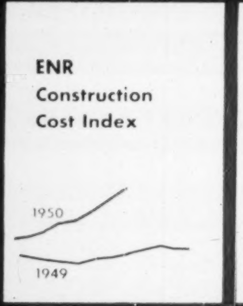
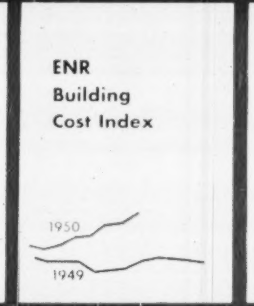
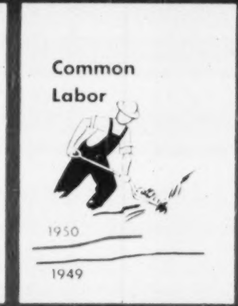
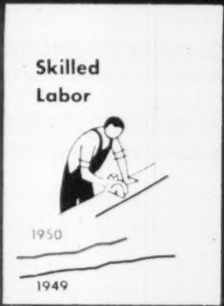
ENGINEERING NEWS-RECORD

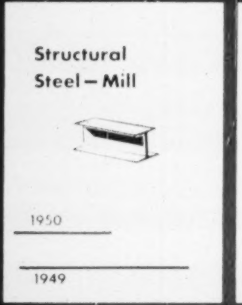
SEVENTY-SIXTH YEAR OF PUBLICATION

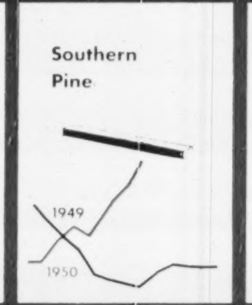


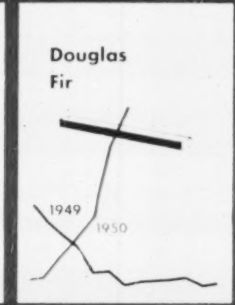


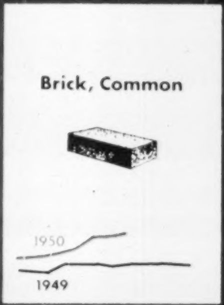


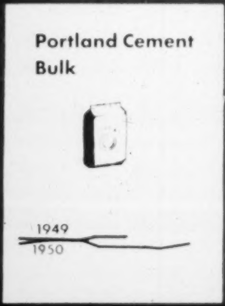


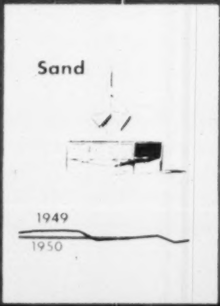


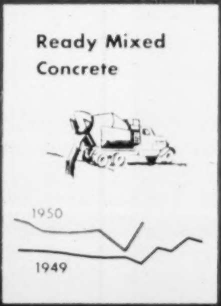


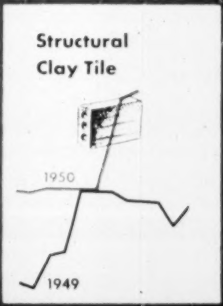












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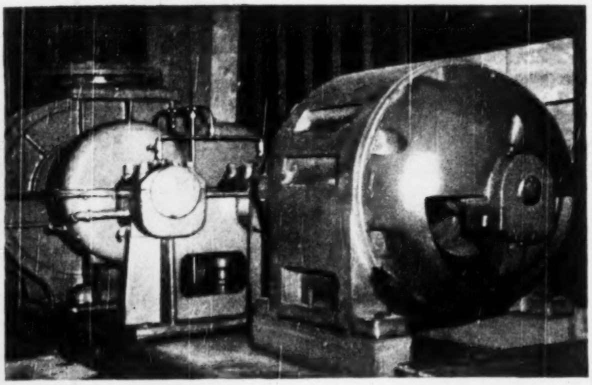
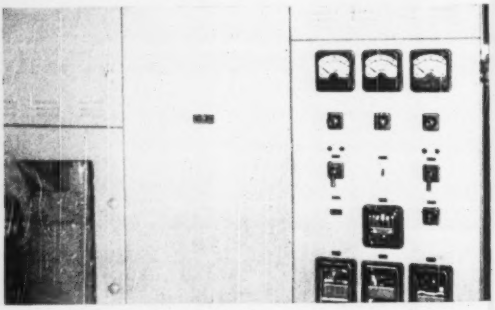
A McGRAW-HILL PUBLICATION

Ventilation for the Delaware Aqueduct tunnel is provided by blowers driven by sturdy G-E 200-hp induction motors. ▶



SAFETY FIRST

▲ Muck is efficiently hauled by 18 G-E battery and battery-trolley locomotives.



▲ Adequate d-c power for trolley service is obtained from eight G-E 150-KW stationary mine-type mercury-arc rectifiers specially designed for this project.

tunneling through the CATSKILLS

... *Electrically*

to bring more water to New York City

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Every day, more contractors are looking to reliable *electrified* equipment for flexibility, safety, and ease of maintenance. With equipment driven by G-E motors and control, and supplied from G-E power distribution systems they get modern *electric drives* with the added advantages of G-E engineering assistance in application, installation and service. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job at lower cost by complete electrification. Write him now, and he'll call on you at your convenience.

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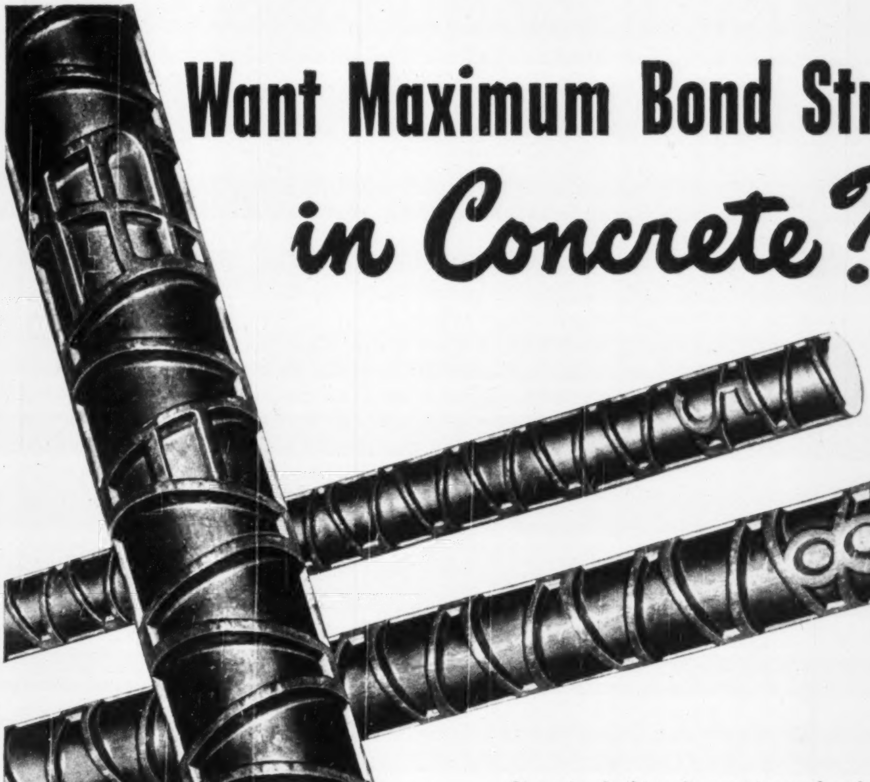
GENERAL ELECTRIC



Want Maximum Bond Strength in Concrete?

If you're looking for maximum bond strength in concrete, use the improved Bethlehem Reinforcing Bar.

The Bethlehem Reinforcing Bar offers extremely high bond strength because of its alternately-sloped, closely-spaced lugs. These lugs provide increased anchorage between concrete and steel because they are more pronounced than the minimum deformations outlined in ASTM Specification A305-49. This firm anchorage means low slip at working loads, which in turn helps prevent the formation of wide tensile cracks in the concrete. The result: More efficient, more economical, neater-looking structures.

The Bethlehem Reinforcing Bar is made from new-billet steel in all sizes from ⅜ in. to 1¼ in. It meets every requirement of ASTM Specification A305-49. For good results, use it on your next concreting job.

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The improved Bethlehem Reinforcing Bar comes in all sizes from ⅜ in. to 1¼ in. Each size is numeral branded for ready size identification, as indicated below.

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No.	*Bar Size*
3 for	⅜ in. round
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5 for	⅝ in. round
6 for	¾ in. round
7 for	⅞ in. round
8 for	1 in. round
9 for	1 in. sq. equiv.
10 for	1⅛ in. sq. equiv.
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ENGINEERING NEWS-RECORD

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Volume 145 AUGUST 10, 1950 No. 6

WALDO G. BOWMAN
Editor

FEATURES IN THIS ISSUE

24 Concrete Bins In 7 Days 30
Self Reliance for Sewage Treatment .... R. D. Buck 32
New Type Radial Crest Gate 35
U. S. Runway Pavement Design Defended 36
Anchor Cells Hold Down Foundation (And Costs) 40
ORVWSC Will Coordinate Area Defense Sanitation 42
Perspective—More Steel, More Production 112

DEPARTMENTS

Construction Week 17
Scoreboard 19
Editorials 21
News of the Week 23
Notes on Legal Decisions 39
Book Reviews 43
Reader Comment 44
Developments Abroad 47
Municipal Affairs 48
Education and Research 50
Men and Jobs 53
Election and Activities 55
Obituaries 59
Material Prices 63
Construction Reports 72
New Products 100

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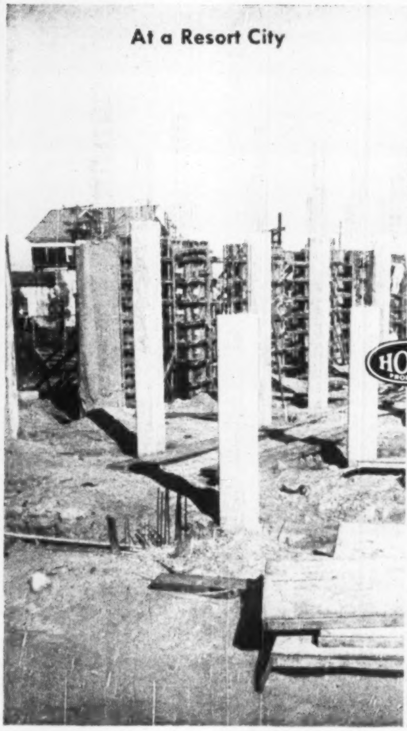
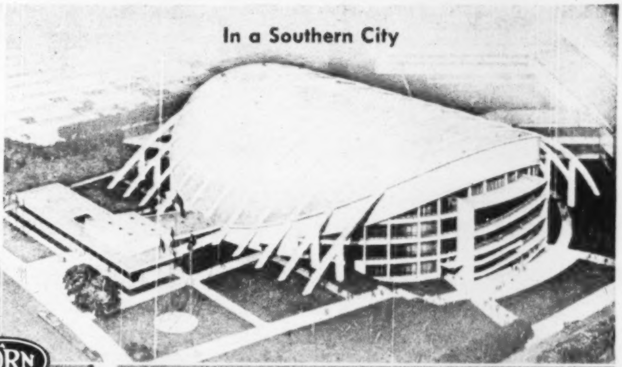
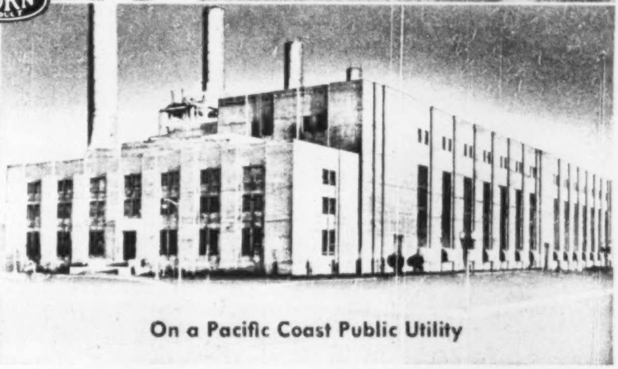


At a Resort City



In a Southern City



On a Pacific Coast Public Utility

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For Protective Coating of Plywood Forms

eliminates
oil staining
and reduces rubbing
costs

All Over America
Contractors Report

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- Increased form use without recoating
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- Eliminates all disadvantages of oil or oil deposits on concrete

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Salt Lake City say:

ALFRED BROWN CO.—
"Rubbing costs reduced, grain raise eliminated."

OLSON CONSTRUCTION—
"More re-uses of forms especially on exposed concrete work."

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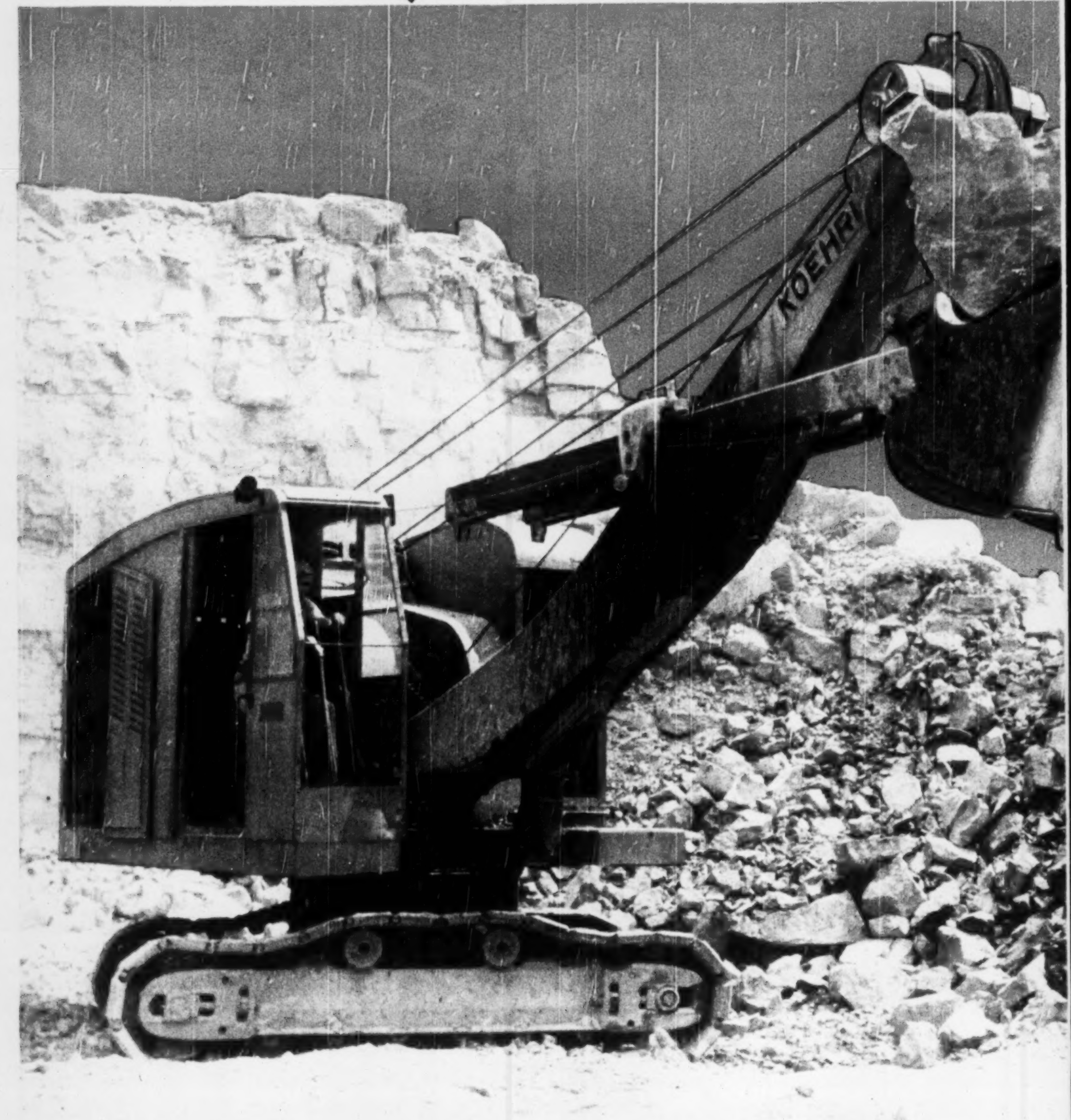

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12
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10
11

The Permutit® Spiractor®—last word in Cold Lime Soda Treatment—softens water in EIGHT MINUTES!

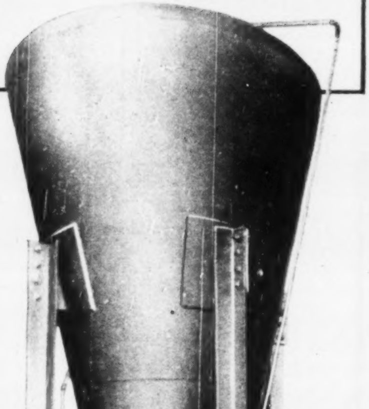
The Spiractor softens water up to 20 times faster than previous cold lime soda methods. That means you can cut your space requirements to a minimum!

Operation of the Spiractor is simple and sure: Hard water and the required lime enter at the base of the cone at a flow rate strong enough to suspend a catalyst bed of calcium carbonate granules without any carryover. The treated water is given a swirling, upward motion by being admitted tangentially to the cone.

The water softening reaction results in precipitates which are deposited on the catalyst granules by accretion. The enlarged granules are drawn off by a valve at the base.

The effluent is soft water that has a low alkalinity content and is suitable for any desired filtration.

Write for full information to The Permutit Company, Dept. ENR-8, 330 West 42nd Street, New York 18, N. Y., or to Permutit Company of Canada, Ltd., Montreal.



Streamlined!

No Moving Parts!

Maximum Output

—in Minimum Space!

Permutit

WATER CONDITIONING HEADQUARTERS FOR OVER 36 YEARS

If you are **PAYING** for a Mack

Why not own one?

When you use a truck that doesn't measure up to its job, you pay for Mack performance . . . *but you don't get it.* You make a slightly higher initial investment when you buy a Mack, but *you save a lot more* by eliminating expensive repair bills . . . loss of earning power . . . costly road failures . . . untimely truck replacement. Today your dollar buys more in a Mack truck than ever before. Measured in terms of enduring reliability; sustained earning power; longer mileage life; lower ton-mile cost—every Mack is a real bargain in profitable hauling. See your nearest Mack branch or distributor. You'll find that, all things considered, the question is—can you afford *not* to own a Mack.

Be Profit-Wise
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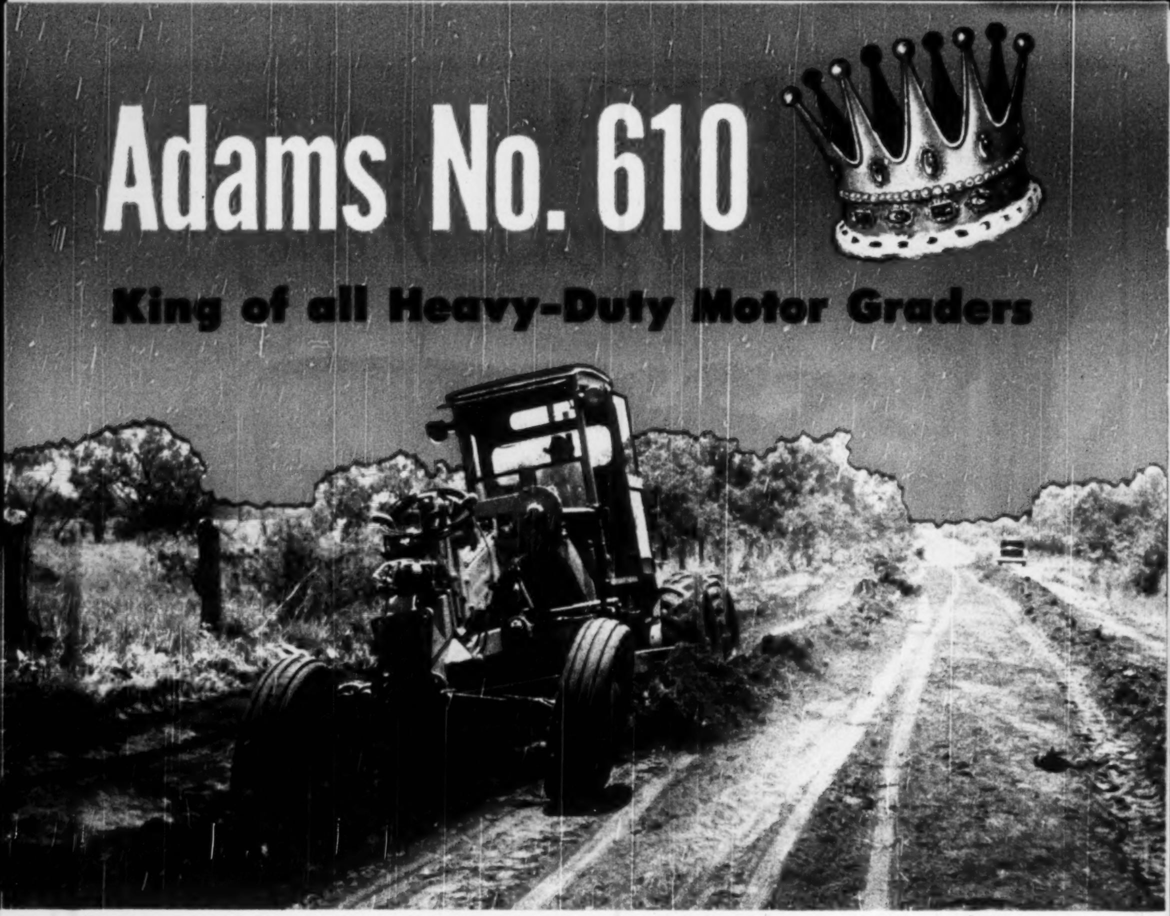

Adams No. 610

King of all Heavy-Duty Motor Graders

"The real heavy-duty champ of motor graders"—"Does 30% more work" . . . That's what owners say about the Adams No. 610 after two years of toughest service.

A big, rugged machine (weighing up to 27,000 lbs.), the No. 610 is engineered to utilize the full torque of its 100-hp. diesel engine—*in all gears.* It's a machine that carries the punch and rugged staying power to tackle and whip biggest, roughest grading jobs.

What's more, the No. 610 offers a combination of operating advantages not to be found in any other motor grader, regardless of size:

Push-Button Starting from Cab—standard.

Power Steering of Mechanical-Hydraulic Type—standard. All advantages of mechanical steering, with power doing the work.

Large, Wide-Tread Tires—for maximum traction and flotation.

8 Overlapping Forward Speeds, 2 Reverse. High transport speed of 25 mph.

Extra Wide Blade (28 in.)—to utilize the great capacity of the No. 610.

Let your local Adams dealer give you complete information on the No. 610—the greatest of all heavy-duty motor graders.

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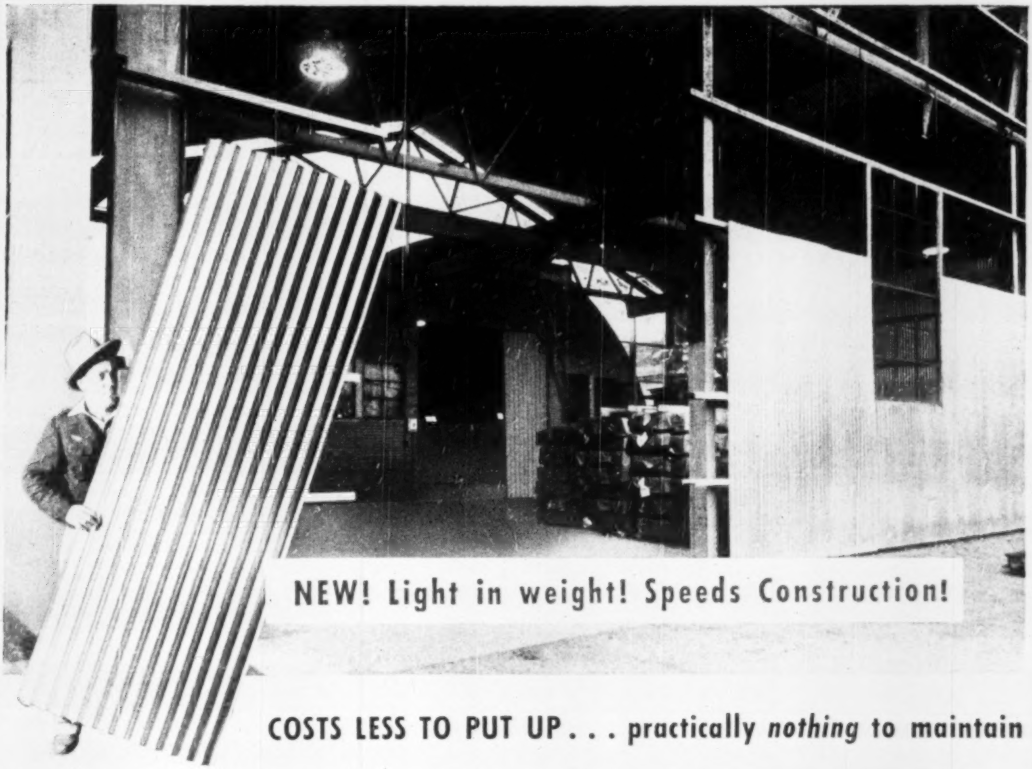
Make your next motor grader an **Adams**



COSTS LESS TO PUT UP . . . practically *nothing* to maintain

Here's a new all-metal building sheet that can help you set new construction records. Alcoa Aluminum Building Sheet weighs only 56 pounds per square. Workmen can erect more per day using only standard tools and methods.

Where painting is difficult and costly, aluminum roofing and siding save money—immediately on first costs and continuously on maintenance. Think about this, then figure your next job with Alcoa Aluminum Building Sheet.

Alcoa Building Sheet is immediately available with all correct fasteners and accessories for easy assembly. For application and engineering details, call your nearby Alcoa sales office, listed under "Aluminum" in your Classified Telephone Directory. Or mail the coupon.

FACTS FOR CONTRACTORS AND ENGINEERS

Alcoa Industrial Building Sheet may be erected over steel or wood purlins or girts. It may be fastened by nails, purlin nails, straps, clips, screws or weldable studs.

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Thickness: .032 inches—equal to 22 U. S. Gauge.

Available for prompt shipment with all types of fasteners, flat and preformed flashing.

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NEVER BEFORE

A Supreme Highway Tire with "Off-the-Road" Traction Never Possible Before!

NOW YOU HAVE THEM

- **FOR ON-AND-OFF-THE-ROAD PERFORMANCE** *never known before*
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- **FOR ALL-ROAD, ALL-LOAD MILEAGE** *never known before*
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JOB FITTED TO YOUR EXACT REQUIREMENTS

No More Layovers That Waste Away Profits

★ FROM LOADING IN THE SAND-PIT AND GUMBO TO SMOOTH HIGHWAY ROLLING—*Job fitted—One and the same tire*

★ FROM SOFT FOREST TRAIL TO NON-SKID HIGHWAY SPEEDS—*Job fitted—One and the same tire*

★ FROM BARNYARD AND MILKSHED ONTO THE HIGHWAY—*Job fitted—One and the same tire*

★ FROM RIVER BEDS TO ASPHALT AND CONCRETE—*Job-fitted—One and the same tire*

The Great On-and-Off-the-Road Fleets Welcome
the Great Job-Fitted Fleetmasters
That Save Money and Build Up Profits

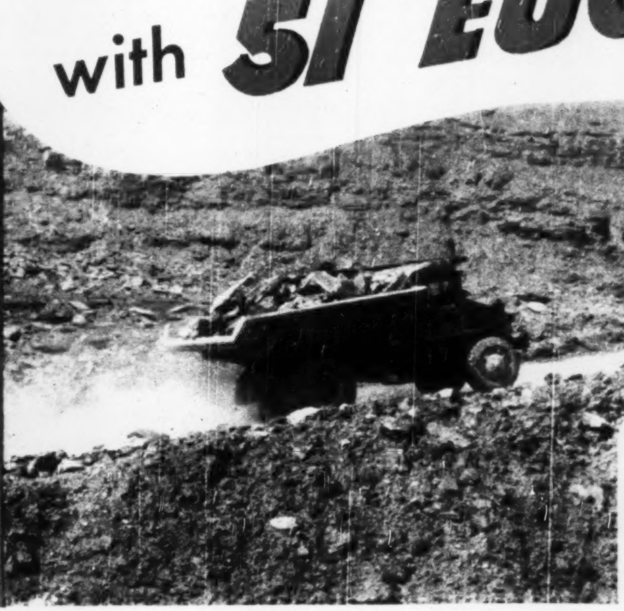
The Great New Mid-Century

U. S. ROYAL FLEETMASTER

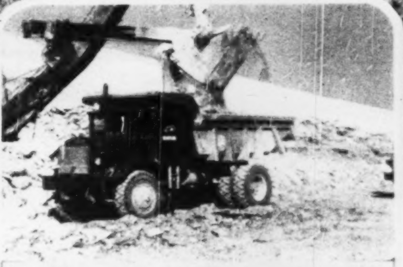
U.S.
ROYAL
TIRES

UNITED STATES RUBBER COMPANY

OPERATION TUNNELS with 51 "EUCS"



This 15-ton Rear-Dump "Euc" loaded with rock excavation climbs a 10 per cent grade at Bowerston, Ohio. Contractor is Hunkin-Conkey Construction Co.



One of the "Eucs" owned by Latrobe Construction Company is loaded with rock and shale by a 2½ yd. shovel.

On contracts totaling 6,500,000 cu. yds. of excavation for relocating the main-line roadbed of the Pennsylvania Railroad in Ohio, 51 "Eucs" are hauling most of the yardage which consists of rock, dirt, and heavy shale.

This relocation will eliminate four single-line tunnels and replace them with double track through large cuts. The material is shovel-loaded into the "Eucs" for hauls averaging one-half mile in length with grades up to 10 per cent.

The speed, large capacity, and rugged staying power of Euclids enable the three contractors on these jobs to stay ahead of schedule. Because they are built for long life and dependable performance in heavy off-the-highway service, Euclids cut hauling costs—they move more loads per hour at more profit per load.

Ask your Euclid Distributor or branch to show you performance data on these and other jobs. There is a Euclid model to meet your requirements for off-the-highway hauling of earth, ore, coal, or rock.

At Rochez Brothers' job near Reed's Mill, O., a "Euc" dumps its 15-ton load of rock over a waste bank.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS—YUKLID CODE—BENTLEY

EUCLIDS *Move the Earth*

Shopping Center
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No job too small
for
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In the course of the next few years, you probably expect to bid on jobs that vary widely in size, complexity and location. Is your Surety qualified to bond your contracts wherever you may wish to bid?

The Ætna Casualty and Surety Company has the facilities to arrange bonds on the largest or smallest jobs. Broad technical knowledge equips its underwriters and representatives to deal intelligently with unusual problems and risks, as well as routine work. A nation-wide service organization and reputation assure unqualified acceptance of its bond, and on-the-spot assistance for its clients, in any part of the country.

Before you file your next bid, investigate the advantages of doing business with The Ætna Casualty and Surety Company.

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The Ætna Life Affiliated Companies write practically every form of insurance and bonding protection

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NEWS BRIEFS

Drive Around 'em—Residents of the Dallas neighborhood which has been urging the city to pave an alley are half satisfied, now that the job's been done. They'll be entirely happy when the telephone company removes the poles which run down the center of the alley—and fills the holes they'll leave.

Homefront Casualty—Plans for construction of the St. Clair County bridge across the Mississippi at Cahokia, Ill., will be held in abeyance pending a determination of what will be possible under restrictions of the Korean war. A county official indicated fears of a shortage of construction materials.

That'll Help—Army Engineers will recommend a federal grant of $3,500,000 toward costs of the $19,000,000 flood control and storage project of the Arvin-Edison water storage district in California. Flood waters of the Caliente and Comanche stream groups would be shunted through a 78-mi canal system and held in five detention basins. A 45-mi concrete-lined canal and a 33-mi earth canal also are part of the project.

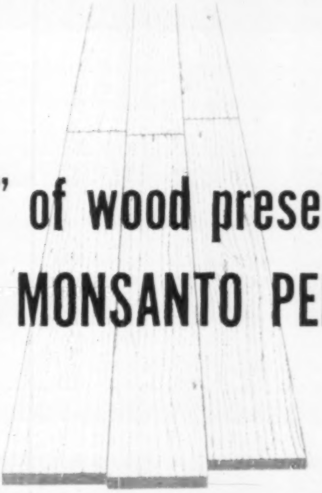
Bigger than Leavitt?—New York City's Housing Authority has opened its 50,000th dwelling unit. It has almost 200,000 tenants; has started, since Jan. 1, 1946, a half-billion dollar construction program which will provide 55,000 units—the largest single housing program ever attempted in this country.

The Bonds are Good—Kentucky's Court of Appeals has upheld the legality of a revenue bond issue by a state agency, proceeds of which are being used to build an annex to the state capitol.

How to Trim Expenses—Members of the Carolina Road Builders Association have voted two to one to consolidate the group with the Carolinas Branch, Associated General Contractors. The two groups have been closely related, with considerable duplication of membership. The Road Builders office, though, will remain open until the end of 1951.

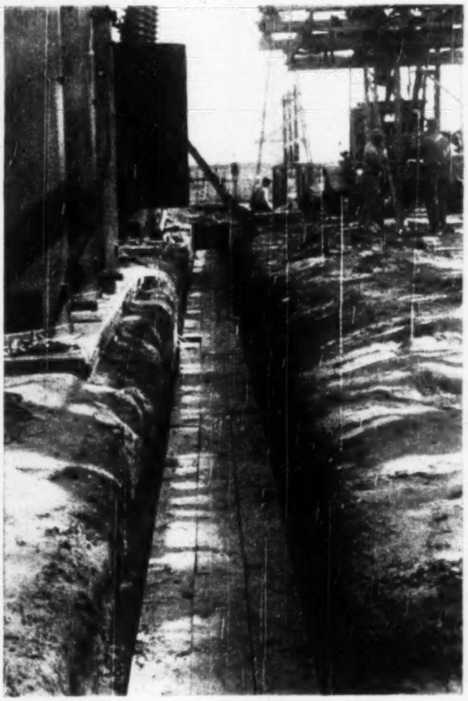
New Postwar Project—International Joint Commission reports it will require $140,000,000 to end pollution of the Great Lakes by sewage and industrial wastes. The study has been

(*Continued on page 14*)



for "tough job" of wood preserving, utility chooses MONSANTO PENTAchlorophenol

(Santophen 20)



MONSANTO PENTA [illegible] protection [illegible] of the Union Electric Company of Missouri's substation, [illegible] St. Louis.

There was a "tough job" for a wood preservative when Union Electric Company of Missouri built safety for workmen and protection for cables into its new substation at St. Louis. To accomplish this built-in protection, underground conduits were covered with heavy planks so that future workmen would not pierce cables accidentally. Obviously, to give *long-lasting* protection, the planks had to be treated with a *long-lasting* preservative. Monsanto PENTAchlorophenol was applied by pressure process at the rate of 10 pounds per cubic foot of wood.

Monsanto PENTA is a *chemically uniform* material. It *stays* in the wood . . . does not evaporate . . . isn't washed away by rain or ground water. Monsanto PENTA gives *positive protection* against termites and other wood-destroying insects . . . against rot organisms. With properly formulated PENTA treatment, wood can be painted or stained. It can be made water repellent.

If you use wood in any application in which long life of the material is desired, it will be worth your while to investigate Monsanto PENTA. For information, mail the coupon or contact the nearest Monsanto Sales Office. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1759-H South Second Street, St. Louis 4, Missouri.

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(*Continued from page 12*)

underway for several years with full cooperation of the province of Ontario.

Cut the Other Guy—Connecticut's State Housing Authority believes its program is sufficiently advanced that it won't suffer any drastic effects from the housing credit directives issued by President Truman. (ENR July 27, p 25). The authority pledges its effort to conserve materials, but pledges also an increased effort to build more homes.

'Raus Mit der Dust—Die schoene Hausfrauen by Reading, Pa., dust from unloaded cement for the Pennsylvania Turnpikestrasse didn't like yet the other day. Waving brooms, a band of them descended on a railroad freight yard, demanding that some other spot be found to unload the cement. They said the neighborhood had become saturated with cement dust, succeeded in halting the unloading. A plea to City Council also worked. The contractor was ordered to find another unloading point. Work on the turnpike's eastern extension was halted briefly.

Wait and See—Reclamation Bureau says its Belle Fourche reservoir, in South Dakota, will have a 500-year useful life. It reached this conclusion after tests showed it had lost less than nine percent of its capacity in 42 years.

Just in Time—Three prefabricated homes were built in the first half of 1950 for every one completed during the corresponding period of 1949, according to the Prefabricated Home Manufacturers' Institute. After more than four years of hard postwar struggle, the industry seems to have arrived—just in time for priorities trouble all over again.

Price Goes Down!—At a time suggestive of a new inflationary cycle, western Washington highway departments and contractors are gloating over a price cut of as much as 6% per ton in paving asphalt. A new asphalt refinery has been opened at Point Wells, north of Seattle, the area's first. Freight costs will make the difference.

Have You the Steel?—Rhode Island's Narragansett Bay Bridge Authority has approved an application to the federal government for a $975,000 loan to start preliminary surveys and construction plans for a $32,310,000 suspension bridge between Jamestown and Newport, R. I. The Navy has ok'd the 7,700-ft structure.

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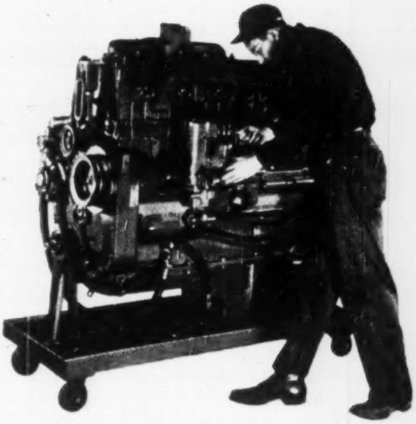

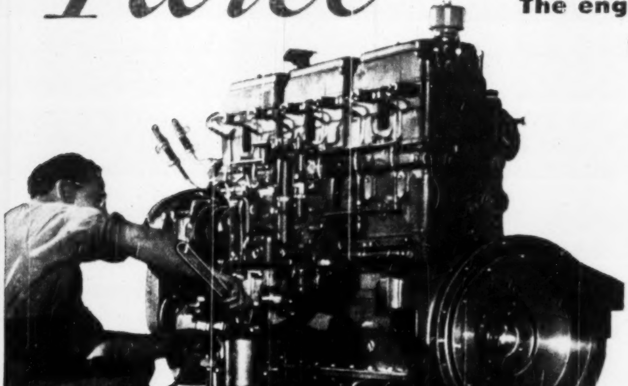

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Why is a lightweight, high-speed Cummins Diesel the best buy in economical, dependable power? *Because every* part of *every* engine is made under strictest quality control methods. Each engine also is actually built *twice*. After initial assembly, each engine is run-in on the test block. Then it is torn down and carefully re-inspected—after that it is re-assembled and tested *again*.

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STEEL STREET FORMS

WRITE FOR BULLETIN 2259 for complete information—28 pages of detailed illustrations show form set-ups for every type of work with complete instructions on how to use them. You'll find *your* job illustrated—you'll see how to make more money on every job.

HERE'S the fastest, most economical method of forming concrete curb, curb and gutter, integral curb or sidewalks you ever saw! One set of Blaw-Knox Steel Forms handles *every* job from simple straight work to serpentine or curved shapes, without the expensive carpentry that boosts man-hour costs and cuts profits. Easy to set and strip, they get the job finished on schedule and well within your estimate. You can use them repeatedly in combinations to fit every requirement. Costly hand finishing is eliminated and finished jobs have a smooth perfection impossible to achieve with wood forms. Form maintenance is practically non-existent.

Start your set of Blaw-Knox Steel Forms *now*—expand it at any time to meet future requirements.

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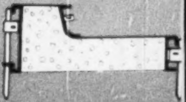
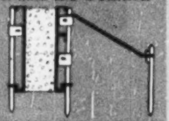


CURB AND GUTTER FORMS For combining concrete curb and gutter when curb is battered.



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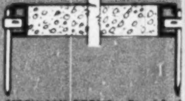

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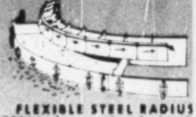

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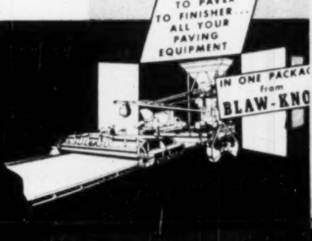
FROM FORMS TO PAVER TO FINISHER... ALL YOUR PAVING EQUIPMENT
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THE CONSTRUCTION WEEK

LABOR WANTS IN—If any kind of a board is needed this time to oversee mobilization, you can make one sure bet—labor will hold a much more central position than it did in War II. That much is clear in discussions going on within NSRB and in action of the two major labor groups toward some kind of coordinated effort. NSRB has already set up plans for a four-section policy committee, (three members each from labor, agriculture, management and the public) on which labor will hold a much more central position than it did on the old three-section War Labor Board. Labor has indicated that it wants in on any such committee in a big way—says it can't give effective service and advice without being in on all phases of any planning that goes on for general mobilization. Labor has, in fact, already designated its policy committee members: William Green of AFL; Philip Murray of CIO; A. J. Hayes of the Machinists. The second significant move on labor's part was a recent series of talks on unification of the labor movement. Nothing definite came of them—but it is significant that participants issued their first joint statement, recapitulating areas in which the two labor federations are already working together: Political action; legislative action; international relations; support of government moves against communists.

MORE POWER CONSTRUCTION?—One of the few facets of construction on which Washington has been at all positive since Korea posed the possibility of controls, has been electric power. We're going to need a lot more power, Washington has said—and U. S. construction agencies have started to jump in to get all the work they can. The next question is: Power for what? Washington talks specifically about aluminum (one pound of aluminum pig requires 10 kwh of energy). There's been talk that power rationing might be required to expand aluminum pig output, though that talk doesn't take account of: (1) There's now no prospect that the U. S. would expand aluminum production as fabulously as it did last time; (2) many areas have now reestablished power capacity reserve margins comparable to those available when the last aluminum expansion started—and no rationing was needed then; (3) there's the question of how best to get the power needed if aluminum was expanded anyhow: Steam is easier to build and quicker, hydro energy may cost less.

WHOSE POWER?—With any discussion of power needs comes the corollary—who controls it? The President has gone along with a policy of defense management that would leave the controls in the hands of existing agencies, at least until a full mobilization is needed. That policy tends to put the Interior Department in the drivers' seat if any controls are put in on new power capacity construction. Interior wanted that kind of authority very much in the last war, never got it.

WHOSE CONTROLS?—Then, of course, there's the overall controls picture—and there will be controls. The betting in Washington now says Stuart Symington's National Resources Planning Board will get the job of dividing up the supply of materials between essential and non-essential production: After subtracting the military supply, it will tell all others how much must go for other essential needs (power generators, farm machinery, etc.) and arrive at a figure that will show how much is left for non-defense-connected needs—the purely civilian economy. At that point, the squabble begins: Who will tell the automobile industry how much steel it may have of what's left—or the telephone industry how much copper? NSRB wants that power, says it is doing the planning and should do the whole job. But the Department of Commerce (which figures it is going to have to do most of the paperwork anyway) also wants the power. The decision is up to Mr. Truman. He can settle it in favor of NSRB or Commerce—or follow Roosevelt's lead and establish a new agency (as the WPB).

PLEASE NOTE—For the "paste in the hat" department re the half war: Observers now figure that the defense boom will run two to three years—assuming no big war; they look for spending at the rate of $25 to $30 billion yearly eventually to keep defenses in shape.

KANSAS PAVEMENTS—Three more concrete paving contracts have been awarded by the Kansas Highway Department to investigate further the strength and durability of its new concrete design using "coarse-ground" elements. Three other contracts, involving 23 miles of concrete pavement, were awarded this spring. (ENR June 22, p 34). The new projects, totalling 13 miles, are located near Chanute, Emporia and Troy. Each will have an aggregate combination not previously used and each is located in an area having different subgrades, rainfall and temperature characteristics. Additional projects of this type were planned for this year but have been postponed due to war conditions. The department believes it is in the national interest not to require special manufacture of cement when the production of regular cement may be taxed to the limit.

WALLACE & TIERNAN CHLORINATORS are Standouts in any Plan

AN OIL REFINERY IN TEXAS needs cooling water chlorination.

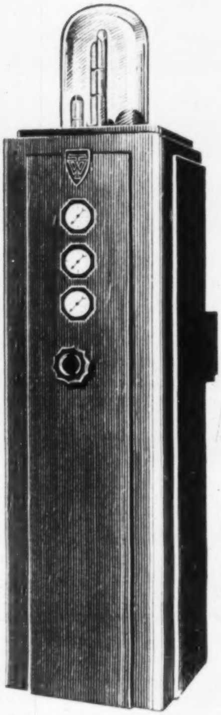
A PAPER MILL IN WISCONSIN requires white water slime control.

A SWIMMING POOL IN CALIFORNIA wants chlorination to guard against water-borne disease.

A SEWAGE PLANT IN INDIANA needs chlorination for disinfection.

A CAMP IN VERMONT wants to sterilize its well supply.

A POWER STATION IN FLORIDA asks for chlorination to improve heat transfer in condensers.



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Call your nearest Wallace & Tiernan Representative for your next job involving chlorination. He will be glad to help you.

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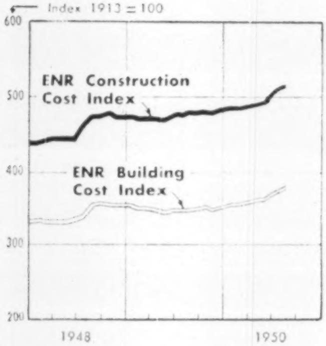
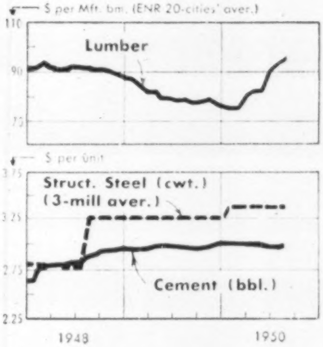
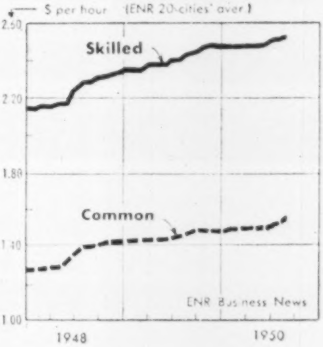
S-60

AUGUST CONSTRUCTION BUSINESS REPORT



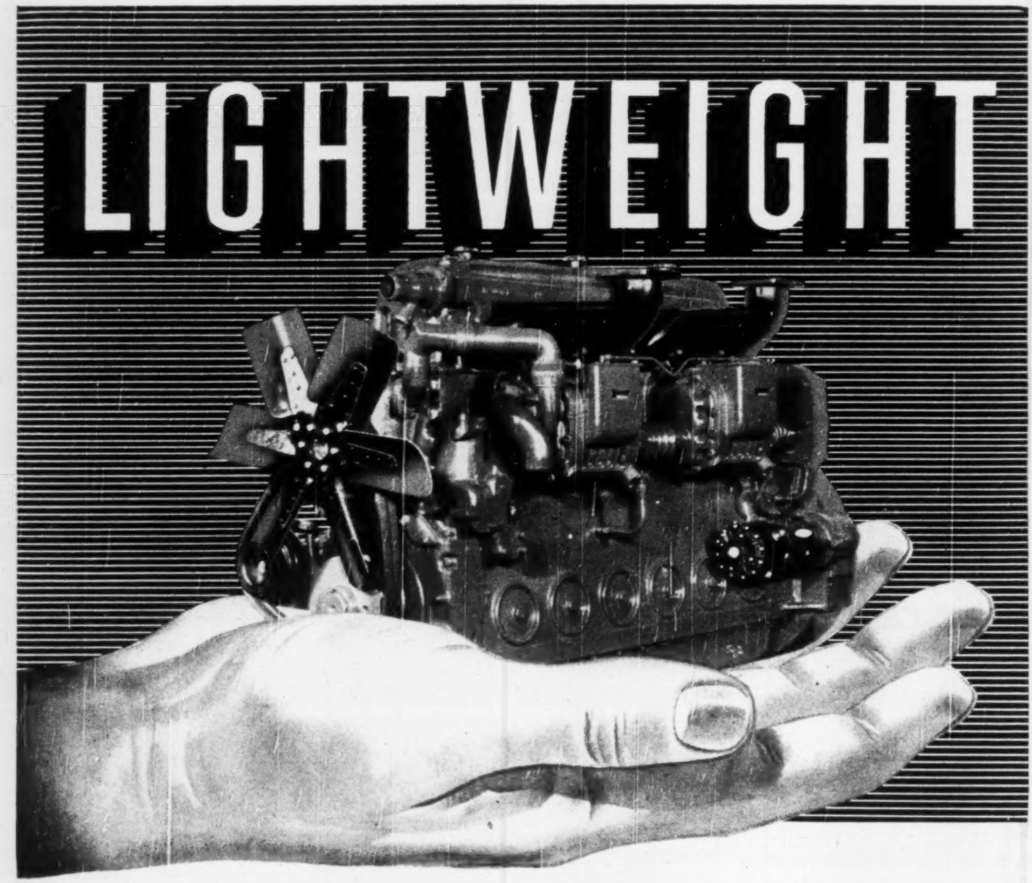




ENR INDEXES (1913 = 100)	Aug. '50	July '50	% Change	Aug. '49	% Change
Construction Cost	520.60	511.91	+1.7	472.28	+ 8.8
Building Cost	382.36	376.90	+1.4	350.85	+ 8.9
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl	2.971	2.966	+0.2	2.954	+ 0.6
Structural Steel, (3-mill aver.), per cwt	3.400	3.400	0.0	3.250	+ 4.6
Sand, per ton	1.970	1.970	0.0	1.981	− 0.5
Lumber, 2x4 Fir, per M ft. bm	106.647	102.015	+4.5	85.691	+24.4
Lumber, 2x4 Pine, M ft. bm	89.387	85.600	+4.4	72.946	+22.5
Common brick, per M	28.775	28.525	+0.9	27.763	+ 3.6
Ready-mixed concrete, per c. y.	10.411	10.265	+1.4	10.181	+ 2.3
Structural Clay Tile, 3x12x12 per M	134.033	133.900	+0.1	132.843	+ 0.9
WAGE RATES (20-cities' average)					
Common	1.561	1.538	+1.5	1.470	+ 6.2
Skilled (aver. 3 trades)	2.544	2.524	+0.8	2.436	+ 4.4
Bricklayers	2.803	2.803	0.0	2.676	+ 4.7
Structural Ironworkers	2.502	2.478	+0.9	2.399	+ 4.3
Carpenters	2.328	2.292	+1.6	2.229	+ 4.4

	July		%	Seven Months		%
CONTRACTS AWARDED (thous.)	1950	1949	Change	1950	1949	Change
Total U. S. (ENR reported)	$1,175,138	$619,442	+89.7	$6,840,204	$4,559,411	+50.0
Private	699,269	221,502	+215.7	3,933,647	2,113,998	+86.1
Public	475,869	397,940	+19.6	2,906,557	2,445,413	+18.8
Federal	115,655	105,839	+ 9.3	831,468	660,932	+25.8
ENR Constr. Volume Index, '13 = 100	495	280	+76.8	396	275	+44.0
NEW CONSTRUCTION CAPITAL						
Total	401,024	452,463	−11.4	2,993,293	3,124,661	− 4.2
State & Municipal Bond Sales	233,636	232,091	+ 0.7	1,697,412	1,627,247	+ 4.3
Corporate Security Sales	167,388	220,372	−24.0	1,295,881	1,497,414	−13.4
Federal (non-federal work)						
Federal (federal work)						

	June (J) May (M)		%	Seven Months (6) Five Months (5)		%
MATERIAL SHIPMENTS & LABOR SUPPLY	1950	1949	Change	1950	1949	Change
Cement, thous. bbls., Bu. of Mines	22,834(M)	19,426(M)	+17.5	75,383(5)	69,634(5)	+ 8.3
Fabr. Struc. Steel, thous. tons, AISC	162(J)	172(J)	− 5.8	912(6)	1,007(6)	− 9.4
Lumber, mil. ft. bm., NLMA	3,683(M)	2,654(M)	+38.8	15,743(5)	11,933(5)	+31.9
Lumber Prod., mil. ft. bm., NLMA	3,576(M)	2,731(M)	+30.9	14,744(5)	12,272(5)	+20.1
Contract Const. Employ., thous. BLS	2,397(J)	2,205(J)	+ 8.7	(Av.) 2,059(6)	(Av.) 2,045(5)	+ 0.7



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Now, for the first time, a line of diesel engines in which *all* major castings are of lightweight alloys. This is what you have waited for . . . *less weight per horsepower,* rugged design for the toughest jobs . . . proved performance. And longer life, too! Write for literature. Diesel Division, Harnischfeger Corp., Port Washington, Wis.

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EDITORIALS

ENGINEERING
NEWS-RECORD

Defense Job for Construction

THERE IS A LINE in our recent story detailing the first reactions to the half-war situation (ENR July 27, p 26) that the construction industry and city and state officials should take soberly to heart.

It concerns the need for a ready, well-equipped industry as a first line of defense against any attack on the U. S. homeland.

Here is a situation that seems fairly obvious—but the possibility of an attack here hasn't been a serious one up to now. And of course, few public agencies have the heavy equipment in enough quantity to do a job that we hope won't have to be done—clearing up after an attack, rescuing survivors, getting utilities going.

There's a "preparedness" job, then, that construction can do—now. It should make up lists of what equipment, what trained personnel it has available and where, and keep any public agency charged with civilian safety advised of its capabilities.

Do It Yourself

EVERY NOW AND THEN a small town steps up and does a big job. A village of about 1,000 independent-minded people—Broad Brook, Conn.—is a good example of just such a town.

This community needed a new sewage-disposal system. Its leaders acknowledged the need and did something about it. They persuaded the people to buy their own collection system and treatment plant—with no help from the federal or state governments. Preferring to pay their own bills, they just scoffed at their slice of the planning melon.

The bill was not a small one. It came to about $297 per capita. It is being financed by bonds issued through a specially erected sewer district with property taxing as well as service-charging power (p. 32).

This proves once again that cities can have pollution-prevention facilities—if there's leadership and a sense of responsibility. In this paternalistic age—when nearly everyone seems to be trying to pass his responsibilities to someone else's shoulders—it is refreshing to find a community that believes in taking care of itself.

Engineers Should Be Promoters

LAST WEEK we reported results of a study made by New York City's Board of Water Supply to demonstrate the weakness of a scheme to supply the city with water pumped from behind a dam across the Hudson River. The refutation, complete and decisive, was several months in preparation.

What was so different about this plan that necessitated preparation of so strong a case against it? Why the fuss over this particular proposal to dam the river when the first of many such suggestions was seriously offered back in 1834? Had not the exhaustive studies made in 1903 and 1923 ruled out the Hudson as a permanent source of additional water so long as purer upland sources exist?

What made the difference was the way in which this revival of a century-old proposal was brought to public attention. Skillful promotional work by an influential citizens' group had put the Board of Water Supply on the spot. Publicity—the power of the press—had built what was at best a very vague proposition into a project the public could visualize and accept.

Few events in recent years have served to point so clearly to the need for good promotional work on the part of engineers for the plans they have evolved for meeting a special problem. If a project is to be sold to the public, the engineers must recognize that their responsibility goes beyond planning. They must promote the project as well. They alone are armed with the facts, figures and logical arguments that are necessary to gain the necessary public approval and support. If they will put these into clear statements for the press, supplemented by attractive sketches if possible, the newspapers will do the rest.

Pollution Abatement Helps

NEW EMPHASIS on stream pollution abatement becomes apparent as the nation girds itself for a maximum industrial production. This is demonstrated in a report from the Ohio River Valley Water Sanitation Commission published in this week's news pages, in which one of the commission's industry committees reveals that its waste-control efforts can aid materially in conserving metals that are important in national defense. The committee, which represents metal-plating industries in the Ohio valley, has been working with the commission in developing a manual of "good-housekeeping" practice. The manual is aimed at showing ways in which plants can operate more carefully so as to reduce the strength and volume of electroplating solutions that might otherwise find their way into the sewer. Not only will adoption of such practices take a substantial pollutional load from the streams but it will make possible the salvage of metals and solutions now being wasted. Some of the latter may soon be in short supply because of the war emergency. Thus the effort by the metal-platers toward stream clean-up can be exercised to provide dual benefits. This is not only a realistic approach to pollution abatement but a constructive contribution to increased industrial productivity.

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OF PROTECTION
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Concrete
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Concrete Reinforcing Bars

...are designed to exceed requirements of the first standard specification covering concrete bar deformations—"Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement"—ASTM Specification A-305-49 adopted June, 1949.

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This means better bonding properties, better anchorage in concrete than ever before—possible savings in steel, in bending, in installation.

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3	0.11	0.375	.376
4	0.20	0.500	.668
5	0.31	0.625	1.043
6	0.44	0.750	1.502
7	0.60	0.875	2.044
8	0.79	1.000	2.670
9	1.00	1.128	3.400
10	1.27	1.270	4.303
11	1.56	1.410	5.313

REPUBLIC STEEL ®

Republic

CONCRETE REINFORCING BARS

ENGINEERING NEWS-RECORD

AUGUST 10, 1950 VOL. 145 NO. 6

No sharp building change seen for 60 to 90 days

Private construction will be hit hardest when Washington gets into construction curtailment—No more than 10% cuts are believed possible in federal and local public works

There won't be any sharp changes in construction activity before October or November.

When such changes come, they'll come first and heaviest out of private construction.

That's as far as Washington had got this week in figuring its way out of the construction jumble.

The best that Washington can see in public works curtailment in fiscal '51 is 10%—none of it in 1950. Federal public works, including federal-aid programs and civil works of the Corps of Engineers, was to be about a $3 billion program in the current fiscal year.

Non-federal public works, Washington feels, won't yield a greater curtailment than that possible for federal works—10%.

• **Private work is expendable**—In private construction, the story's different. Residential and commercial volume will shrink heavily, Washington feels. Existing restrictions of housing credit, (ENR July 27, p 25), could hold housing starts this year to 1,000,000—and still further down to 750,000 next year. These figures can be lowered readily if need be.

Elsewhere in private construction, uncertainty already has begun to have some effect. Some lending institutions have suspended loans until they get some clarification of what will happen. Some commercial projects have been withdrawn, their sponsors unwilling to risk priority or allocation troubles in addition to threatening material shortages and tightened credit.

The defense powers act now on its speedy way through Congress will give ample power to shut-down theater, race track, bowling alley and comparable projects. Washington is confident it'll be used promptly.

• **Industrial volume good**—Industrial and utility construction volume doesn't worry Washington much, even though spotty slowdowns may be anticipated. Additional capacity for steel and other metals production will result in considerable building.

The Atomic Energy Commission will furnish a lot of construction—stood to do so, in fact, even before last week's announcement that E. I. du Pont de Nemours & Co. had agreed to build and operate plants for the production of hydrogen bombs. For that project, President Truman already has asked $260 million.

Without offering dimensions, Washington still feels that the volume of new industrial construction for defense-war purposes will be substantial. The defense act now in Congress will provide for huge sums to make loans and contracts that would stimulate materials and defense production. And if they can, federal construction agencies will push considerable hydroelectric power construction.

• **In a vacuum**—The figuring today is based on judgment and experience—it must be, in the absence of specific orders, specific policies, specific knowledge of exactly how much of the various scarce materials the defense program will take.

One of the shining examples of the approach to the construction curtailment problem is furnished by the Bureau of Public Roads. All last week, state highway departments were reviewing their federal-aid road construction programs at BPR's request. The object: To determine which had major value to the defense effort and which, for want of such value, might reasonably not be advertised. BPR district engineers were working with the departments on the surveys. Sensible as such a survey is under existing conditions, BPR was unable to give the states a more specific set of criteria for determining essentiality than the standard it received from the President. Mr. Truman had asked all federal agencies to review their programs and eliminate what was found not to be necessary for defense.

Top men of a dozen federal construction agencies met with the Budget Bureau recently to get some guidance of measuring essentiality of their programs. The answers they got boiled down to judgment.

(*Continued on page 24*)

POWER BOATS COMING—Army Engineers are almost through with the Chain of Rocks canal locks near Granite City, Ill. To be completed by Sept. 30, the $18,000,000 locks will let river traffic pass easily beside a bad spot on the Mississippi River. Men in the foreground are working on tunnels through which water will flow to raise and lower traffic. (Wide World Photo)

SALT WATER BLOCK—Will percolation basins halt salt water intrusion? The idea is being tested by the Los Angeles County Flood Control District. Here is the site of one of two such tests.

Percolation tested as water guard

Los Angeles County Flood Control District currently is experimenting with two spreading basins and an abandoned well near the coastal towns of Redondo and Manhattan Beach to determine if salt water encroachment of the ground water supply can be halted.

The objective is to build up and maintain a hydraulic head of fresh water that will hold back the salt invasion.

The saline front has been moving inland from the ocean at a rate of 150 to 600 ft a year. It endangers water supply for many coastal towns and presents a serious problem for industrial development that hinges on reliable water sources.

The district has two 1-acre spreading basins in operation, each holding 2 acre-ft of water. Engineers are trying to determine the geological practicability of halting the advancing saline front by percolating methods. Two 4-in. test wells, north and south of the test basins, have been drilled to gage the efficiency of recharging the water table and to prove the water barrier theory.

• **Might recharge waste water**—The experiment is a preliminary move toward action by the West Basin Water District. It proposes reclamation of waste water through spreading to replenish underground water supplies.

Fresh water is being piped from the nearby Dominguez area.

The control district is simultaneously recharging a well section abandoned last year by Manhattan Beach when saline intrusion reached 1,000 ppm. Recharging is continuous, at a rate of 1½ to 2 cfs; water is being introduced into one of the abandoned wells under a constant head, eliminating entrained air.

When the recharging of the abandoned Manhattan Beach wells was begun, only 600 ppm of salt in water were found. This decrease was attributed to an extended period in which the wells went unused. Today, recharging has brought the salt content down to 200 ppm, a substantial improvement.

• **Salt reduction significant**—Finley Laverty, division engineer for the control district, terms this decrease "significant." Two test holes, one 1,300 and the other 2,300 ft, have been drilled on either side of the recharged wells. These, along with the newly drilled wells on the fringe of the basins, gives the control district a net of wells for the gaging and charting saline progress.

Some idea of the maximum progress of saline encroachment is evidenced by recent testings which showed the saline front had moved inland 1,000 ft in slightly more than a year since the Manhattan wells were abandoned in favor of a location that was 3,000 ft inland.

The percolation basins are the outcome of USGS preliminary surveys conducted in 1940. These showed that saline encroachment could possibly be halted or even forced back by recharging.

The first survey in the area, in 1905, showed that the radiant sloped seaward, preventing sea water encroachment. But a flood control survey in 1931 showed a definite radiant landward—allowing the saline encroachment.

A court action is pending now to stop further drilling of wells in the area and to limit industrial out-take. New drains on the water table, combined with increasing saline pollution, could have a serious effect on the area's industry.

No sharp building change seen for 60 to 90 days

(Continued from page 23)

• **Green light for earthmoving**—It seems plain now that earthmoving projects aren't in much trouble yet. The machinery isn't in heavy demand for defense work and such work doesn't draw heavily on manpower. While fuel can be had for the equipment, trouble seems remote for work of this nature.

Highways, though, as substantial users of steel, face a different situation. There's a division of opinion as to what will happen on roads. Some anticipate a repetition of War II experience, when shortening steel supplies just pinched off considerable work, funneled what steel could be had to the most vital projects. But others figure that cutbacks will come through BPR's discretionary approval or disapproval of projects.

(All federal-aid contracts are subject to this approval. But it will be 60 to 90 days before it can be exercised by responsible agencies.)

• **Defense value paramount**—In 1951, essentiality will be the test, Washington feels certain. A road that will break bottlenecks in defense areas—or speed industrial traffic—will get priority. But you always get back to steel. How much steel a road takes will be a factor.

On other federal-aid and federal construction, defense-usefulness will be considered, too. Some VA hospitals and other federal structures already are under restudy for blast resistance against atomic attack. (ENR July 20, p 31). Congress is ready to vote $150 million for federal-aid for local hospitals. The feeling is that government thinking will bar expenditure of these funds in likely target areas. This could delay work.

• **Strike a balance**—And most federal works money goes for continuation of work in progress. That can be expensive to cut off, but it can also be expensive—particularly in materials to carry on. Can a flood control project protect an essential industry or area? How much lost production because of floods could it obviate if it were finished? Is that worth the steel? Is it worth the steel now rather than some time later? How long will it take to achieve the protection the project offers?

These are the factors. They'll be applied much as they were in War II, although somewhat less urgency, since this isn't a total war.

There's a lot of federal works money, also, that goes to maintenance of existing facilities—harbors, canals, inland waterways. This work can't safely be neglected.

Political roadblocks hit Ohio highways

War and party politics are giving Ohio Highway Director T. J. Kauer a tough summer.

Kauer, who doubles in brass as a member of the Ohio Turnpike Commission, faces two problems:

1. Getting on with a big road construction program—which includes a $250 million cross-state toll road—in the face of threatened war-born material and manpower shortages, and
2. Avoiding the impact of legal actions brought by State Auditor Joseph T. Ferguson.

Solution of the war-generated problem, of course, rests in large part with Washington, particularly as far as the Turnpike is concerned. "If the Army wants it," Kauer said recently, "it will be built."

• **Ferguson's not so easy**—Sidestepping Ferguson will be something else again, apparently. Kauer won out some months ago when Ferguson contested the highway department's right to lend $600,000 to the turnpike commission to pay for engineering surveys of the toll road.

But Ferguson won the most recent legal test—involving the department's right to hire consulting engineers. The state Supreme Court upheld Ferguson's contention that no such right exists. As a result, Kauer can't use consultants—and he still can't hire the 100 engineers he says the department needs—at least not competent men at the state's wage scale. Ferguson says the decision will halt expenditure of about $1,000,000 for work he feels state engineers ought to do.

Political analysts note: The litigation and accompanying dispute command considerable newspaper space; Ferguson is the Democratic candidate for Senator Taft's seat.

The nuisance quotient of all this, so far as Ohio roadbuilding is concerned, isn't confined to the courts. A Columbus newspaper noted that minutes of a recent turnpike commission meeting were recorded by wire transcription—at the personal expense of commission members. The group had been using a highway department secretary to record its meetings. She wasn't used in this meeting, Kauer explained, because it was feared non-department work might jeopardize her paycheck. Her highway department job classification, Kauer explained, does not include commission administrative work.

• **Anti - preparedness?** — Ferguson, meanwhile, was accused of obstructing military preparedness by the chairman of a pro-turnpike association. E. M. Green, of the Ohio Highway and Turnpike Association, said this resulted from Ferguson's refusal to honor vouchers for payment of consultants working on the turnpike surveys. Green jabbed also at Gov. Frank Lausche, asserting that the governor should have attempted to have Ferguson cited for contempt of the state Supreme Court because of a refusal to abide by its decision on funds for the commission.

• **Highway planning**—Kauer described the "no-money-for-consultants" decision as "a blow to our long-range planning program," including a proposed Cleveland - Columbus - Cincinnati express highway. The department has been ready to negotiate for a survey of such a road, Kauer said, adding that the decision "will slow us down—we cannot get engineers and the war situation will make it worse."

The decision involved a voucher for $5,565 to pay Alden E. Stilson & Associates, a Columbus consultant, for surveys of three state routes in two counties. At least one Kansas City and three New York City consultants also were unpaid for work already performed. Still other surveys will be "hampered," by the decision. Payment for work done apparently will rest with the state Sundry Claims Board unless cities will assume the cost.

• **Turnpike approval near?** — Indications were that the turnpike commission is about ready to OK the route which has been recommended to it. The same approval appeared to be forthcoming, thereafter, from Gov. Lausche. There remained some possibility of late efforts to move the route nearer Cleveland. A public hearing was to be held on a one-mile-wide location across the state within which the road would be placed. As proposed, this strip would run from the western terminus of the Pennsylvania Turnpike westward to Indiana. En route it would pass south of Youngstown, Niles and Warren, north of Akron and Medina, between Lorain and Elyria, north of Norwalk and Fremont, across the Maumee River south of Toledo.

HAVING DESIRED EFFECT

Effects of new federal regulations restricting credit buying have been felt in San Mateo, Calif. There, a proposed $1,500,000 private housing project has been abandoned.

Thomas Culligan of Conway and Culligan Construction Co., said the 100-home project must be cancelled because President Truman's order restricting credit "would put the proposed houses beyond the reach of most potential buyers."

Wm. Mueser dies; expert on reinforced concrete

William Mueser, 78, consulting engineer and one of the pioneers in the use of reinforced concrete, died Aug. 4 at Mount Kisco, N. Y., at the home of his son, William H. Mueser, of the engineering firm of Moran, Proctor, Freeman & Mueser.

Born in Germany and educated there, Mr. Mueser came to this country in 1893. Two years later he became associated with the Melan Arch Construction Co., first as a designer of reinforced concrete arch bridges and later as owner. In 1900, with Edwin Thacher, he set up the Concrete-Steel Engineering Co. This new company specialized in all types of reinforced concrete construction. Mr. Mueser acquired Mr. Thacher's interest in 1911 and continued the company until 1933 when he went into government service where he continued until his retirement in 1940.

Mr. Mueser originated numerous elements of the reinforced concrete structures built by his firms, many of which later became accepted practice. Many of the early bridges built of reinforced concrete were designed by him, including the first arch bridge of that type to be built in this country, at Rock Rapids, Iowa. Other notable structures included the 107-span causeway at Galveston, Texas, the bridge over the Mississippi at Minneapolis, and the Mayo Free Bridge across the James River at Richmond, Va., a structure of 18 spans. The reinforced concrete sheet piling used extensively in the Galveston seawall was designed by Mr. Mueser.

Texas Supreme Court gets highway wage case

Texas' Attorney General, Price Daniel, has asked the state Supreme Court to review an appeals court ruling which permits a union to sue the state regarding the level of a "prevailing wage" to be paid on state jobs.

The state's Third Court of Civil Appeals upheld an action by the El Paso Building and Construction Trades Council, AFL, which sought to force the Texas Highway Commission to use the wage as the prevailing wage, instead of a commission-set wage. State law demands prevailing wages for state work. Daniel said the appeals court's ruling would subject every contract to a suit to decide the prevailing wage. The law intended just the opposite, he said.

Boston paving report hits city officials

Latest in series of investigations of street program charges negligence, contract changes, improper payments

A fifth report on improper conduct of Boston's street repair program finds the city's Finance Commission levelling these charges:

1. Responsible officials are frequently remiss in requiring thickness of material demanded by contracts.

2. They do not hesitate to change at will the actual requirements of work executed.

3. They authorize payment for work not performed.

The report followed four others, (ENR June 22, p 30) which detailed improper conduct in numerous sections of the city. This one asserted that, with 75 streets investigated, 60% of them show sub-standard performance on the contracts. And it details conditions on a number of Dorchester streets.

• **Perhaps one more**—As a result of the investigations, the city's law department is continuing to study what procedure might be adopted against the contractors who have failed to reimburse the city. Fin Com may issue yet another report summarizing all its investigations.

The latest report asserted that there were numerous cases where contractors performed less work than that for which they contracted. This was true, the report declared, even though the commissioner of public works then in office testified before the commission that he had authorized no changes in contracts.

In every such case, the report adds, deviations which lacked official authority were carried through without penalty. And in each such case, those records that are on file make it appear that the contractor met the contract exactly and was so paid.

• **Not trivial cases**—The report made it plain that the deviations were not those of a fraction of an inch or so. They are instances of complete disregard for the contractually prescribed method—in which an alternative was followed that gave the city distinctly less than it paid for. The report says:

"Written contracts have meant little or nothing to the engineers and inspectors of the service. In some instances, many of these officials have decided, without benefit of reading the contracts, what work should be done. In other instances, they acquiesced without protest to determination by the contractor of what should be done. In fact, in most instances the only recognition given to the written contract was in the make-up of the allowances for payment to the contractor. In order that approval for payment by the auditor might be obtained, the engineer usually made up figures to match the contract requirements regardless of the actual work performed or material delivered . . . so much of the records is falsification that the official records of the work performed in street paving are completely unreliable, except, obviously, as to the amount of money paid."

• **Specifically**—The report cites the case of an engineer of 34 years' service in the department, who drew specifications without inspecting the site. He consulted no superior, says the report, before telling the contractor what he wanted done (this after visiting the site and deciding that contract requirements needed changing). The report adds that the engineer admitted "cooking up" a certificate that would come out right in dollars and cents and that would conform to the units in the contract.

The engineer was quoted as admitting that he never figured what the contractor actually did, and as conceding that he had no way of knowing how much the contractor actually earned.

• **Too busy?**—It was impossible, the engineer testified according to the report, to visit the site before preparing for bids "because it was a political year." The order was received one day before the contract was let.

ATOMIC DEFENSE HANDBOOK

At the request of the Atomic Energy Commission, the McGraw-Hill Book Company will publish, on Aug. 28, a volume entitled "The Effects of Atomic Weapons: Prepared for and in cooperation with the Department of Defense, and the U. S. Atomic Commission under the direction of the Los Alamos Scientific Laboratory."

The volume is a technical summary of the results to be expected on the detonation of atomic weapons. Its purpose is to provide the technically interested person—municipal authorities, medical and public health officials, water works, civil and utility and transportation engineers with an understanding of the enormous energy release accompanying an atomic explosion and, at the same time, to give a basis for the development and administration of protective measures. These topics are covered: Principles of Atomic Explosion; Description of an Atomic Explosion; Physical Damage; Thermal Radiation and Incendiary Effects; Initial Nuclear Radiations; Residual Nuclear Radiations and Contamination; Measurement of Nuclear Radiations; Decontamination; Effect on Personnel; Protection of Personnel.

Metal-finishing pollution attacked in Ohio Basin

Defense mobilization isn't curtailing the activity of the Ohio River Valley Water Sanitation Commission. The agency's latest specific attack on stream pollution in its eight-state area may even yield some materials-conservation benefits.

Object of the latest program is to draft measures which will curtail wastes from metal-finishing industries. The dividend could be savings of metals and plating solutions used by them and both facing war-generated shortages.

A plant practice manual is being drafted for the electro-plating industries, according to W. L. Pinner, research manager of the Houdaille-Hershey Corp., of Detroit, and chairman of an 11-man committee organized by ORVWSC and representing Ohio River Valley metal finishing industries.

Pollutional discharges from some of the plants may be reduced as much as 50% by the methods to be outlined in the manual, Pinner believes.

Subcommittees will evaluate present waste treatment methods, outline methods of conducting plant waste surveys, study toxicity potentials of various wastes and develop standard analytical procedures.

◆

Massachusetts approves new road bond issue

Massachusett's Gov. Paul Dever has signed a bill authorizing a second $100 million bond issue for state road construction. Proceeds of the first are still being spent throughout the state.

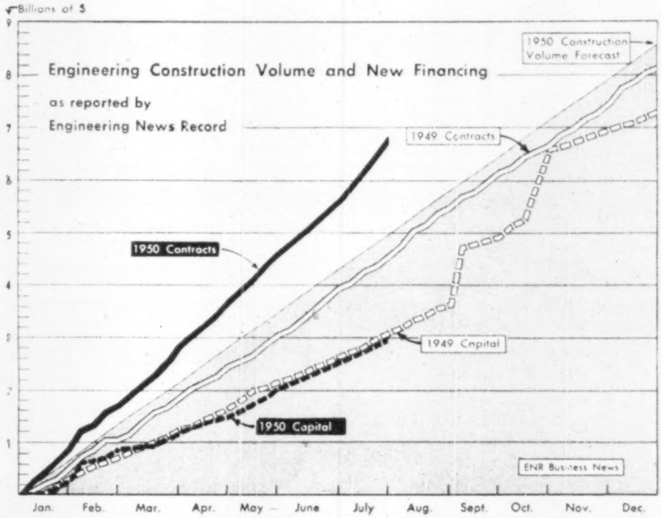
A parallel attempt in the legislature to meet the cost of the program by increasing gasoline taxes failed to become law.

The new issue will provide roads in and out of the Boston area, extensive resurfacing and the installation of safety devices. Public Works Commissioner W. F. Callahan, who handled the program resulting from the first issue, also will handle this second project.

Almost all the $53,000,000 from the first issue which was allocated to roads outside the Boston area is under contract or is covered by work ready for bidding, Callahan said.

Work is to start soon on a route connecting the Mystic River Bridge with downtown Boston. Bidding is near on the $37,000,000 Central Artery through the city. And the $8,000,000 Esplanade along the Charles River Basin, on the Boston side, should be in service in November of this year.

CONSTRUCTION BUSINESS



Engineering construction in July breaks all records

The heaviest volume of construction project starts in history pushed the July engineering construction total to $1,175 million for four weeks. It also raised the 7-month volume to $6,840 million, both all-time records for heavy construction reported by ENGINEERING NEWS-RECORD.

This total for the year to date is now 50% ahead of last year, with private building up 86% and public work up 19%. Only public housing, down 38% and earthwork and waterways, down 16%, are running behind last year. Waterworks construction is up 38%; sewerage, 3%; bridges, 17%; streets and roads 45%; public buildings, other than housing, 38%; and public unclassified, 21%.

Industrial building is up 25%, private mass housing 118%, and other commercial building 68%. Large pipeline contracts have pushed up the private unclassified total through July for a 122% gain.

Price increases small except for lumber

Lumber prices broke through their 1948 highs in late July to set a new record. But other construction prices so far show either only a small increase or none at all to date in the face of the industry's general expectation of higher prices.

The base prices of steel are holding (except for stainless and galvanized products). Cement prices are steady in spite of critical shortages in a number of areas.

Both sand and the aggregates are holding the line, but ready-mix concrete increased 1.4% over July and is 2.3% above last year. These percentages are based on the 20-cities averages reported by ENGINEERING NEWS-RECORD.

Common brick is up almost 1% over July and 3.6% above a year ago. But structural clay tile is up only a fraction for the month and not quite 1% for the year.

Lumber prices at the beginning of August are 4.5% higher than a month ago and up 23% from last year. Fir is 24.4% higher than a year ago and pine 22.5% higher.

Common labor is up 1.5% for August from the July report and 6.2% above August, 1949. The skilled labor average is 0.8 higher for the month, up 4.4% since last August.

The lumber, labor, steel and cement prices weighted and combined for the ENR cost indexes raise the Construction Cost Index 1.7% for the month and 8.8% since last August. The building Cost Index has increased 1.4% for the month, 8.9% since August, 1949.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—JULY, 1950

ENGINEERING NEWS-RECORD *reports continental U. S. Construction projects of the following minimum costs: Waterworks, excavation, drainage and irrigation,* $28,000; *other public works* $50,000; *industrial buildings,* $68,000; *other buildings,* $250,000.

Four Weeks—Thousands of Dollars (000 Omitted)

	July, 1950							U. S. Cumulative Seven Months		% Change	Canada
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1950	1949	'49 '50	July, 1950
Public Works											
Waterworks	809	1,534	2,015	1,213	4,756	2,521	**12,848**	**131,315**	95,085	+38	988
Sewerage	3,897	3,722	2,002	1,693	4,519	4,433	**26,266**	**148,272**	144,002	+ 3	3,900
Bridges	792	20,278	2,064	4,463	3,185	2,184	**32,966**	**221,167**	188,363	+17	218
Earthwork and waterways	616	1,284	9,346	754	21,344	25,770	**59,114**	**295,396**	350,597	−16	1,314
Streets and roads	6,556	38,949	17,216	22,624	35,300	16,875	**137,520**	**755,266**	522,307	+45	8,170
Public buildings, residential	11,201	11,266	2,177	5,783	4,728	637	**35,792**	**153,902**	249,075	−38	6,328
Other public buildings	5,785	19,484	28,294	16,717	34,548	32,901	**137,729**	**966,063**	700,944	+38	5,932
Unclassified	4,619	4,891	4,515	3,614	14,161	7,834	**39,634**	**235,176**	195,040	+21	1,729
Total public	**34,275**	**101,408**	**67,629**	**56,861**	**122,541**	**93,155**	**475,869**	**2,906,557**	**2,445,413**	**+19**	**28,579**
Federal government (included in above classifications)	3,000	7,584	11,469	6,962	51,521	35,119	**115,655**	**831,468**	660,932	+26	6,015
Private											
Bridges				2,006	200		**2,206**	**6,186**	3,263	+90	
Industrial buildings	845	10,180	26,677	48,287	12,642	9,160	**107,791**	**686,978**	551,143	+25	3,828
Com'l. buildings, residential	2,250	76,054	18,297	64,822	62,687	28,768	**252,878**	**2,159,676**	992,198	+118	5,276
Other commercial buildings	7,963	30,438	9,306	13,622	19,408	11,548	**92,288**	**553,848**	330,058	+68	2,388
Unclassified	304	2,793	49,038	48,665	131,202	12,104	**244,106**	**526,959**	237,336	+122	2,664
Total private	**13,362**	**119,465**	**103,321**	**177,402**	**226,139**	**61,580**	**699,269**	**3,933,647**	**2,113,998**	**+86**	**14,156**
Total Engineering Construction:											
July, 1950 — 4 weeks	**45,637**	**220,873**	**170,950**	**234,263**	**348,680**	**154,735**	**1,175,138**				**42,735**
June, 1950 — 5 weeks	54,236	334,277	189,210	184,540	311,210	180,247	**1,253,720**				65,802
July 1949 — 4 weeks	35,688	133,902	88,419	71,240	211,668	78,525	**619,442**				58,747
Seven Months — 1950	331,058	1,681,081	996,172	1,010,369	1,652,904	1,168,530	....	**6,840,204**		+50	342,030
Seven Months — 1949	**211,075**	**1,120,340**	**676,999**	**588,056**	**1,247,405**	**715,536**			**4,559,411**		**357,789**
% Change '49 to '50	+57	+50	+47	+72	+32	+63					−4

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 72, went to press.)

Hospital—Veterans Administration asks bids August 15 for construction of hospital, including elevator and dumbwaiters, at University Dr. and Brackenridge St., Pittsburgh, Pa., to cost an estimated $13,000,000.

Housing Project—New York City Housing Authority will receive bids August 29 on Governor Alfred E. Smith Houses, lower Manhattan, for foundations and general construction, heating and ventilating, electric work, plumbing and elevators.

Refining Unit—M. W. Kellogg Co., of New York, was awarded contract by Gulf Oil Corp. for construction of $8,000,000 fluid catalytic petroleum refining unit at the Port Arthur, Tex., refinery, 60,000-barrel capacity.

Housing Project—E. Edward Litchfield, Jasper Place, Alta., plans to construct 1,250-unit community housing project in Jasper Place, near Edmonton, for $8,400,000.

Dwellings—Taylor-Todd Corp., Fort Worth, Tex., will build 1,000 dwellings near Quartermaster Depot, Fort Worth, for an estimated $6,000,000. Easterwood and Easterwood, architects.

Substation—Atomic Energy Commission, Oak Ridge, Tenn., awarded contract for electrical substation, switchhouse and switchyard to Gustav Hirsch Organization, Inc., Columbus, O., for $7,274,000. Hirsch Organization awarded sub-contract for buildings to Traylor Bros., Inc., Evansville, Ind., for $1,179,000.

Public Building—Department of Public Works, Ottawa, Ont., asks bids August 23 for construction of superstructure of National Printing Bureau building, 3 stories, basement with penthouse in Hull, Que. Estimated cost is $5,500,000. G. Brault and E. Gormier, Montreal, Que., are architects.

Expressway—Gull Contracting Co., Inc., Flushing, N. Y., submitted low bid of $3,473,974 for 0.61 mile of Van Wyck Expressway, Hoover Ave. and 87th Ave., Queens County, N. Y.

Hotel—Canadian National Railways, Montreal, Que., asks bids Sept. 8 on 16-story addition to Macdonald Hotel, Edmonton, Alta., to provide 300 rooms, shopping centre, ballroom and banquet halls. Estimated cost is $4,500,000. G. J. Drummond, Montreal, is architect; J. L. Charles, Winnipeg Man., engineer.

Highway—Baughman & Blair, Inc., & Potter DeWitt Corp., Pavilion, N. Y., were low bidders at $3,568,305 for 6.4 miles of highway construction on Ontario Thruway, Montezuma and Port Byron, N. Y.

Hospital—Sisters of Charity (Daughters of Charity of St. Vincent de Paul) plan 5-story, basement, 250-bed hospital and nurses home on O'Connor Hospital site, San Jose, Calif., to cost $4,000,000. Magnolo & Quick, St. Louis, Mo., and Frank T. Georgeson, San Francisco, are architects; Ellison & King, San Francisco, consulting engineers.

Apartments—Severn River Naval Command, Annapolis, Md., plans 2-story, basement, brick frame garden apartment with 400 family units for $4,000,000. Plans by Shreve, Walker & Associates.

Housing—City of Denver, Colo., Housing Authority received low bid on 400-unit housing project at West 42nd Ave. and Lipan St. from Thomas Bate & Sons, Denver, at $2,897,000. T. H. Baell & Co. is architect.

High School Addition—Board of Education, Irvington, N. J., plans an addition to the present high school building to accommodate 700 more pupils at an estimated $1,600,000.

Housing Development—Robert Elliott Syndicate awarded contract to Elliott Construction Co., Ltd., Hamilton, Ont., for construction of 375-unit housing development on 86-acre site in Hamilton. Estimated cost is $3,000,000.

Warehouse—Pigott Construction Co., Ltd., Hamilton, Ont., was awarded contract for 1-story, 388 x 950 ft central parts distribution warehouse in Osharva, Ont., by General Motors of Canada, Ltd., to cost approximately $2,000,000. Allward and Gouinlock, Toronto, are architects.

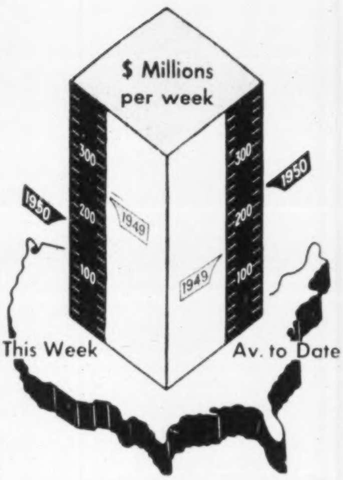
Architectural Building—J. A. Jones Construction Co., Atlanta, Ga., was low bidder for architectural building at Georgia School of Technology in Atlanta, at $1,014,865. Bush-Brown, Galley & Heffernan are architects.

Hospital—Sydney Hospital Commission, Sydney, N. S., asks bids August 28 for 6-story, T-shaped, 100-bed hospital at about $1,206,000. H. J. Smith, Toronto, Ont., is architect.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Aug. '50	520.60	259.25
Building Cost	Aug. '50	382.36	206.69
Volume	July '50	495	217



Activity This Week

As reported to ENR
(in millions of dollars)

Amount of contracts let

	Week of Aug. 10 1950	Cumulative 1950 (32 wks.)	1949 (32 wks.)	% chge
Federal	$9.5	$861.5	$702.9	+23
State & Mun.	67.1	2,214.8	2,003.0	+11
Total Public	$76.6	$3,076.3	$2,706.0	+14
Total Private	87.5	4,137.2	2,350.0	+76
U. S. Total	**$164.1**	**$7,213.5**	**$5,056.0**	**+43**

Contracts by type of work

	This Week	Cumulative 1950 (32 wks.)	1949 (32 wks.)	% chge
Waterworks	$3.3	$137.3	$142.6	−4
Sewerage	3.6	155.9	164.6	−5
Bridges	3.8	235.2	202.0	+16
Highways	20.9	805.5	578.7	+39
Earthwork,				
Waterways	1.0	301.2	376.0	−20
Buildings:				
Public	21.5	1,025.7	763.5	+34
Housg., pub.	15.2	175.2	275.9	−36
Housg., priv.	31.8	2,248.7	1,057.8	+113
Industrial	33.1	748.6	668.0	+12
Commercial	17.9	595.2	362.6	+64
Unclassified	11.8	785.5	464.3	+69

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1950 (32 wks.)	1949 (32 wks.)	% chge
Corporate Securities	$1,342.5	$1,594.6	−16
State and Municipal:	*		
Excl. housing	1,332.0	1,280.5	+4
Housing	464.2	516.0	−10
Total Capital	**$3,138.7**	**$3,391.2**	**−7**

NSPE states principles on collective bargaining

The National Society of Professional Engineers has just issued a "Statement of Principles Regarding Collective Bargaining by Professional Employees." It contains two statements, each with explanatory footnotes, which were adopted by the Board of Directors of the society at the society's annual meeting at Boston in June. (ENR June 22, p 25). These statements follow:

1. It is definitely unprofessional for a professional engineer, professionally employed, VOLUNTARILY to join a heterogeneous labor union, dominated by, or obligated to, nonprofessional groups. As stated by the society, through its Board of Directors, at Oklahoma City in September, 1948. "The individual responsibility and independent judgment required of a professional engineer are incompatible with the regimentation fundamentally inherent in unionization."

Nothing in this statement of principle shall be construed as a criticism of engineers who may be forced to join a labor union, against their will, but engineers in this predicament should seek to extricate themselves by due process of law.

Nothing in this statement of principle shall be construed as a criticism of engineers-in-training, who voluntarily join a labor union when, as a step in their practical engineering training, they are temporarily employed in nonprofessional or subprofessional work, where their fellow workers are organized. When promoted to professional responsibilities, however, the engineer cannot continue his labor union affiliations without sacrifice of professional status.

2. Organizations of professional engineers for collective bargaining, in any form are to be deplored, although their existence, for the present, may be condoned under certain circumstances.

When engineers are treated collectively by an employer, they may be compelled to deal with him on the same basis. Employers should appreciate that engineers have individual capacities and talents which should be considered on an individual basis, that the compensation of an engineer should be in proportion to the value of his services and not based on his age, his degrees, or any other yardstick that can be applied collectively, and that an engineer's working conditions should conform to the nature of his work rather than to any general pattern applicable to employees engaged in routine tasks that are subject to standardization.

When employers generally are persuaded that professional employees must be viewed as individuals and not in groups or classes, then NSPE may condemn collective bargaining by professional engineers, without qualification. In the meantime, we advise the young engineer that the existence of collective bargaining by professional engineers in an industry jeopardizes his professional status. Either the employer fails to appreciate the professional nature of his engineer's work, or the employees themselves are not adhering to professional concepts. Therefore, professional engineers and engineers-in-training should not seek employment where professional engineers, professionally employed, bargain collectively.

DEFENSE PROJECT—The Korean war hasn't hurt this highway, but has helped it. Here's the finished section of the Baltimore-Washington Expressway. It will not only link the two cities but will serve Baltimore's new Friendship Airport and Fort Meade, both important defense facilities.

War Spurs D. C. - Baltimore highway

Defense needs of the national capital are giving an added push to highway and airport bills for the Washington, D. C., area. The Senate passed and sent to the White House a measure that will permit contract awards this year on the Washington end of the new four-lane divided parkway to Baltimore, (see photograph above).

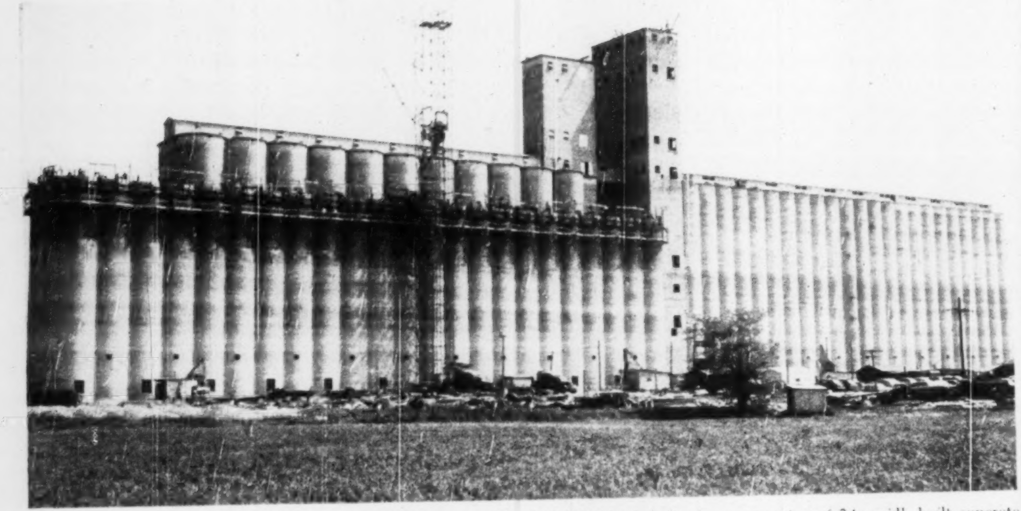
While in the House, the Interstate Commerce Committee was to act on a Senate-approved bill for a second civilian airport to serve the capital and relieve over-crowding at National Airport.

Urging passage of the parkway bill, Maryland's Senator Tydings pointed out that the highway will furnish high-speed connection not only with Fort Meade but, more importantly, with Baltimore's new Friendship Airport. He called this airport the major defense of the national capital in event of air attack. Its 2-mi runway, he declared, is the only strip now available that will accommodate any airplane now in operation or so far proposed.

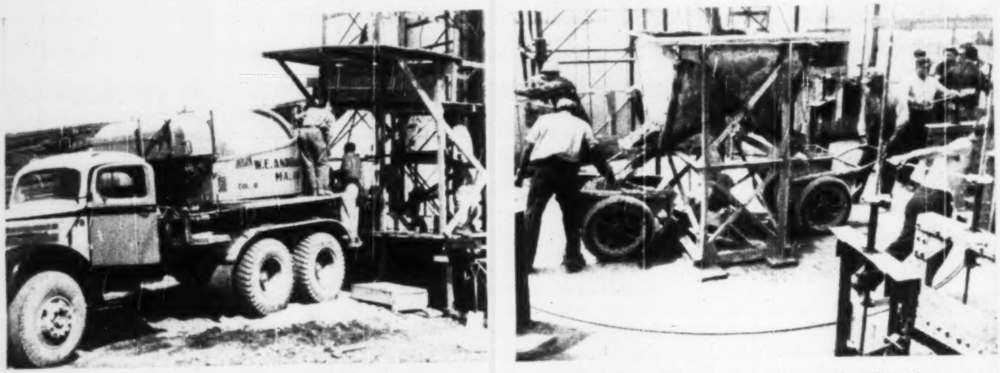
Maryland already has under construction most of the work on its 12.5-mi portion of the parkway from Baltimore to the northern boundary of Fort Meade—to cost more than $14,500,000. The present bill authorizes $13,000,000 to build the federal government's 19-mile section from the District of Columbia line to the same point. Needed lands for this portion have been acquired by the Bureau of Public Roads out of a $2,000,000 allocation made for the purpose in 1942.

The overall highway bill reported out by the Senate Public Works Committee last month makes $3,000,000 of the funds authorized for parkways available for contract immediately. Congress is almost sure to include this provision in the final bill. The $3,000,000 contract authority then would be utilized to start work on the federal government's portion of the Baltimore-Washington parkway.

Construction of the capital's second airport will come more slowly. The present bill merely authorizes a new $14,000,000 terminal. An appropriation bill will have to follow before the Civil Aeronautics Administration can begin buying land for the site. Several locations have been proposed in Virginia—near Annandale—and in Maryland.



STORAGE CAPACITY of this Ohio grain terminal was raised by 1,200,000 bushels by the construction of 24 rapidly-built concrete bins, each 127 ft high and 20 ft in diameter. Speed of construction is credited to use of sliding forms.



CONCRETE was transported about 8 mi by a fleet of 3-cu yd truck mixers (at left), hoisted up a 182-ft materials tower, chuted into a twin-gate hopper at deck-level (at right), and "buggied" into place. Floating deck and sliding forms were raised 9½-in. per hour by workmen operating special screw jacks at 1-min. intervals.

24 Concrete Bins in 7 Days

SLIDING FORMS for the construction of tall grain elevator bins are not new, but they usually result in spectacular, incredibly fast construction schedules.

One such example is a battery of 24 elevator bins (48 ft wide, 337 ft long and 127 ft high) containing 6,300 cu yd of concrete, which was completed last May in 7 days ½ hr, the actual time it took to place the concrete.

The new bins are an addition to the terminal storage facilities of the Farm Bureau Cooperative Association, near Columbus, Ohio. Total storage capacity of the terminal is 3,200,000 bu. This is made up of 22 bins built in 1946 to hold 800,000 bu of grain; 24 bins completed early this spring for 1,200,000 bu; and the 24 new bins described here for an additional 1,200,000 bu.

The new battery of bins contains 24 main circular bins, 20 ft in dia, interconnected with star-shaped interstice bins. Exterior walls of all the bins are 8-in. thick; interior walls are 7 in. of reinforced concrete.

• Beat previous record—Construction by the sliding-form method permitted all walls of the 24 new bins to be brought up simultaneously, with concrete placement being carried on 24 hr per day. Average rate of rise was 9½-in. per hour, or 19½-ft per day.

This was from 3- to 5-ft per day faster than the rate of rise on the 24 bins completed earlier this year—the same contractor did the work on both sets of bins.

The working deck and its attached sliding forms were jacked upward by the deck crew upon a horn signal which sounded every minute. Jacking rods were 1-in. dia, placed vertically in the center of the walls at 8½-ft intervals. As the walls rose, additional 1-in. rods were placed upon the ends of those previously embedded in the concrete and held in positive vertical alignment by steel sleeves placed over them at the joints.

The 1-in. jacking rods, together with ½-in. vertical rods at 2-ft intervals constitute the main vertical reinforcement. Horizontal reinforcement was overlapping, semi-circular ⅝-in. rods at 1-ft intervals. Reinforcement was hoisted to the working deck by a Chicago boom mounted on the materials tower.

A total of 460 tons of reinforcing steel, exclusive of the jacking rods was used in the 24 bins. Access to the working deck was made possible by placing inclined ladders mounted inside of the materials tower.

• Transit mix concrete—Average rate of pour for the entire 6,300 cu yd of concrete in the bins was 35 cu yd per hour, using a 100-man crew per shift, exclusive of the concrete delivery crew.

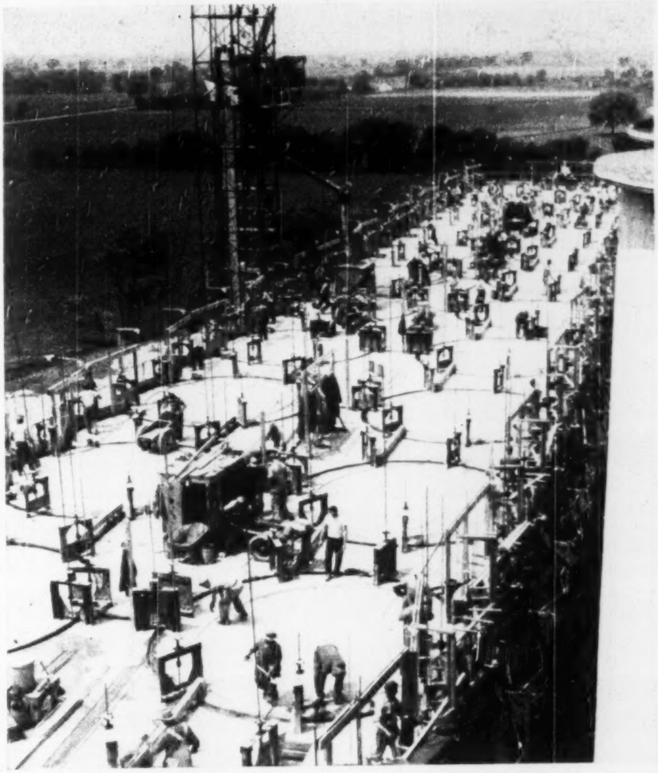
All of the concrete used was transit mixed, with a specified maximum slump of 5 in. Six 3-cu yd truck mixers served the project during the day, from a batching plant 5 mi from the site. These 6 trucks also served the night shift, augmented by 4 additional trucks; all operating from a second batching plant 8 mi from the site.

The concrete was discharged directly into a 1-cu yd concrete bucket and hoisted up a 182-ft, twin-shaft materials tower—one shaft for concrete, the other for workmen.

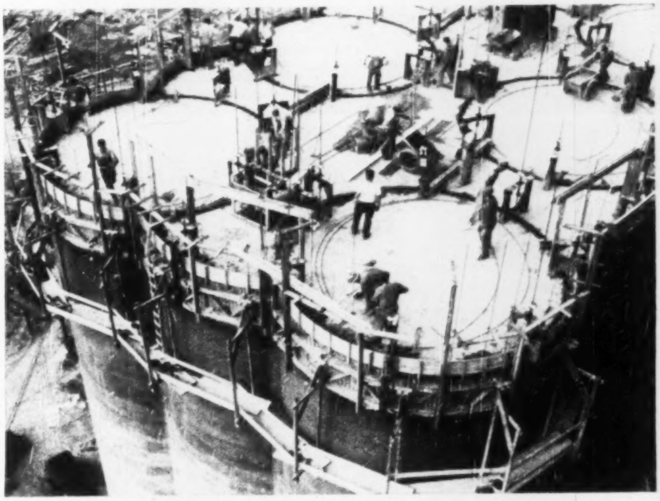
The concrete was dumped automatically into a two-gate hopper at deck level, transported in pneumatically-tired buggies and dumped directly into the forms.

Contract time for placing all the concrete was 8 days; but the contractor finished the job in 7 days ¼ hr, actual pouring time. The contract price was $500,000.

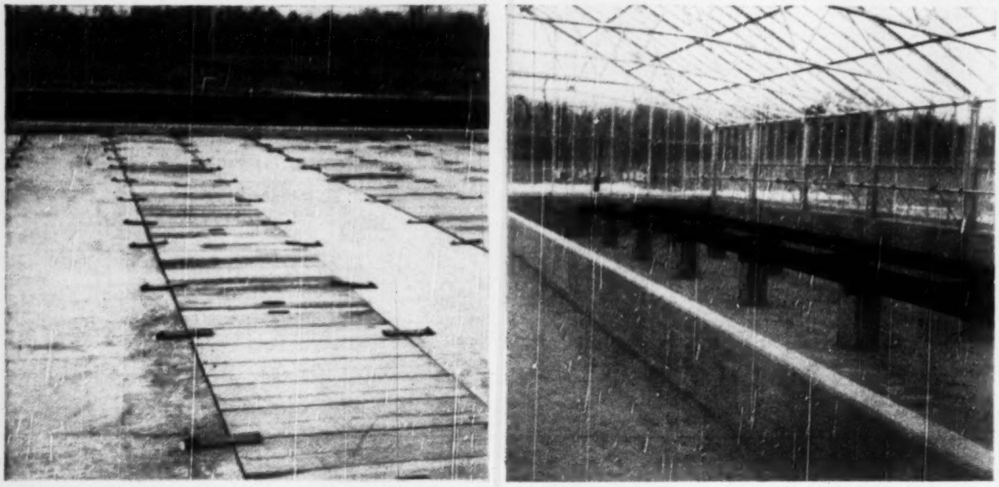
Contractor on the job was the James Stewart Corp., Chicago. S. A. Johnson is general manager and K. E. Long, construction superintendent. W. E. Anderson Sons Co, Columbus, held a subcontract for furnishing and delivering the concrete to the job. All of the photographs and some of the information for this article were furnished by the Jaeger Machine Co., manufacturer of the truck mixers used on the job.



TOP-SIDE VIEW of operation shows highly coordinated activities of concreting crew, deck crew, and reinforcing steel crew.



TIMBER HANDRAILS protected workmen from falls, while suspended catwalk facilitated the concrete-finishing operations.



CONCRETE WALKWAYS and lugged down wooden hatches cover septic tanks. Pickup trucks ride over sludge-drying beds on plate-and-angle wheelways. This speeds cake removal and filter sand replacement.

Self Reliance for Sewage Treatment

Robinson D. Buck
Buck & Buck, Engineers
Hartford, Conn.

BROAD BROOK—populated by about 1,000 Connecticut Yankees—believes in taking care of itself. Facing the need of providing up-to-date sewage disposal, it did the job with no financial help from the federal or state government, completing the new sewers and treatment plant in Dec. 1949.

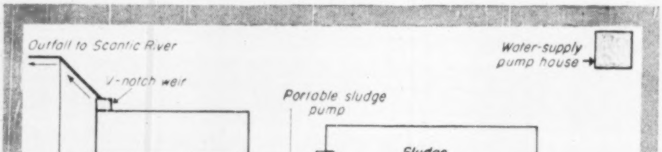
• **How they did it**—To carry their own load, the community's leaders turned to the authority-type of organization. After thorough investigation, wartime delay, and persistent promotion, the Broad Brook Sewer District was set up by the state legislature in 1945. (It's much easier to do this now because Connecticut has a streamlined enabling act that speeds formation of such organizations—see ENR Aug. 4, 1949 p 70 and April 6, 1950 p 112).

To establish a financial record as well as build up a construction fund, the district's voters gave the first board of commissioners the authority to tax real property 2¢ per year per one hundred valuation. Started in Dec. 1946, this levy produced $72,000 in three years.

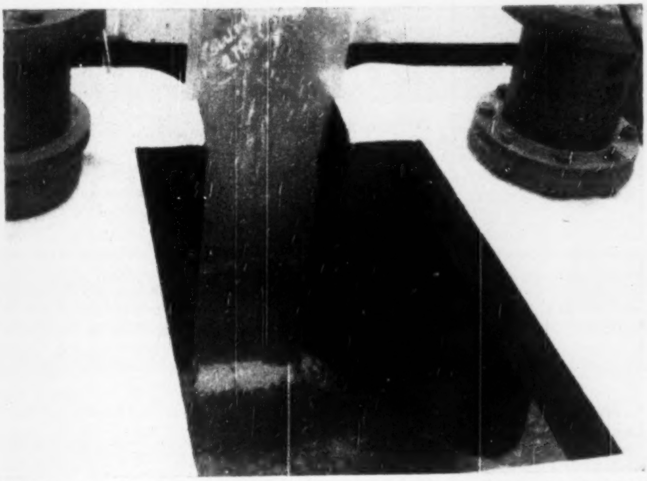
With a total construction budget of $297,000, a bond issue for $225,000 was floated to make up the difference. Bonds are general-obligation serial backed by the full faith and credit of the district. Interest rate is 2%.

In preparing the district's 1950 budget, it was found that a 1.2¢ tax rate would produce sufficient funds to cover all costs of maintenance and operation of the sewage system as well as bond-issue interest and amortization. This rate was adopted with the approval of the town's only big industry—a woolen mill—even though it meant that the mill would have to bear a very large portion of the project cost. (The original finance plan called for a sewer-service charge and two assessments: One based on the front footage of buildable properties; the other on the grand-list valuation. This was recommended to apportion cost equitably between the high-value, compact mill properties and low-value, great-frontage farm lands.)

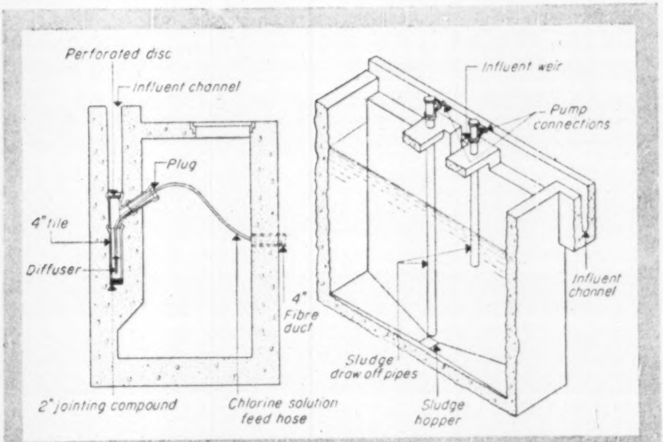
• **The process**—Sewage treatment is: Grit removal; pre-chlorination; septic-tank settling and sludge digestion; sludge drying; and effluent dilution.



SETTLING AND ANAEROBIC DIGESTION in septic tanks and sludge drying make for minimum mechanization. This cuts down a small town's operating cost.



FLOW of chlorinated raw sewage into septic tanks is controlled by an aluminum slide plate that is held in vertical recesses.



CHLORINE can be added to raw sewage as it enters septic tanks. Tanks are emptied in two stages: First—supernatant; second sludge.

Sewage enters the plant through a manhole with a normally closed bypass gate. The gate stand is drilled for insertion of a car seal by the state department of health.

Grit is settled out in a long, narrow single-channel chamber. It is removed manually with a hoe as wide as the channel. Hoeing the grit to the influent end of the channel and lifting it through the flowing sewage washes out some of the organic material. Disposal is by burial.

After grit removal, sewage is dosed with chlorine during the warm months. Normal flows receive about 18 ppm to insure a chlorine residual in the plant effluent. Considerably higher rates, however, can be delivered. It is believed that the chlorine will reduce gas formation and improve sedimentation.

Settling and anaerobic digestion is in three parallel septic tanks. Each tank has an adjustable influent and effluent weir as well as concrete baffles to spread the flow and retain floating solids. Concrete walkways alternate with removable wooden hatches to cover the normally closed tanks. This permits ventilation and access for cleaning or to plunge scum.

Septic-tank effluent—measured by a V-notch weir—is discharged to the Scantic River through a submerged outfall.

Stream records at the point of discharge indicate a dilution of 11.3 cfs per 1,000 persons based on a 15-yr. minimum flow and the 1970 estimated population. Ninety percent of the time, dilution will exceed 26.0 cfs per 1,000 persons. With this dilution, only primary treatment is needed.

• Solid matter—Digested sludge from septic tanks is pumped to glass-inclosed drying beds by a portable, double diaphragm pump. Inclosure is for wet-weather drying and odor control. Suction and discharge hoses connect to the withdrawal fittings on each tank and the 8-in. discharge manifold on the sludge beds.

The two wall-divided beds—large enough to hold 85% of the fluid contents of one septic tank—have concrete side walls and base slab. Four-inch underdrains, spaced on 10-ft centers, are covered with 12 in. of graded stone and 12 in. of washed filter sand.

Discharge from underdrains is returned to septic-tank influent, just following the chlorine diffuser.

Each section of the beds has an 8 ft. door and a plate-and-angle wheelway. The wheelway carries a pickup truck within seven feet of any point on the beds. This speeds up sludge removal and replacement of filter sand.

Dried sludge can be disposed of on the site as fill. A ready market, however, probably will be found for it among farmers in the region—as a soil conditioner for crops not eaten raw. The sludge will be available after a reasonable storage period.

• Disinfection facilities—Chlorine for pre-settling dosage is delivered from a solution-feed unit in a small brick building. Space is available for a duplicate unit.

Water for chlorinator operation and plant washing is drawn from the river above the plant outfall. The automatically actuated pump and pressure tank are housed separately. A 2-in. pipe loop serves conveniently located hydrants around the plant.

The chlorine building also houses a toilet, sink and bench for simple sewage tests. Its temperature is maintained above 40 deg. by an electric space-heater. A power-driven exhaust fan—with switch at the door—will remove chlorine rapidly in event of a leak. A gas mask is included.

• Operating the tanks—The operating schedule contemplates utilization of one septic tank at a time. This will allow completion of digestion and consolidation in the other two units. It is expected that the operating tank

ANALYSIS OF COMPOSITE SAMPLES

(15-min. intervals for 5½ hr)

Collected and analyzed by Connecticut Department of Health

Characteristic	Raw Sewage	Plant Effluent	Percentage Reduction
Solids			
Total (ppm)	600	350	41.7
Fixed (ppm)	320	220	31.2
Volatile (ppm)	280	130	53.6
Suspended (ppm)	180	41	77.1
Settleable 2 hr. (ml)	10	0.1	99.0
5-day BOD at 20 deg. C (ppm)	160	53	67.0
Turbidity	190	70	63.2
Color	Gray	Gray	
Hydrogen-Ion Concentration (pH)	7.3	7.1	
Chlorides as Cl (ppm)	34	23	
Alkalinity as CaCO (ppm)	120	110	
Nitrogen Constituents as Nitrogen (n)			
Nitrate (ppm)	1.0	3.0	
Ammonia (ppm)	11	7.9	
Organic (ppm)	17	7.9	

DESIGN AND ENGINEERING DATA

Sewage-Treatment Plant, Broad Brook, Conn.

Treatment: Grit chamber, pre-chlorination, septic tanks, measuring weir, covered sludge drying beds.

Plant Capacity: 208,000 gpd normal; 283,000 gpd peak; 1,500 design population.

Grit Chamber: Single channel, manually cleaned, 8 in. wide; 16 ft. long; 1.0 fps peak flow; 0.73 fps normal flow.

Pre-chlorination: One manual-control, solution-feed unit, max. capacity 200 lb per day. Spare meters for 8 to 40 lb per day and 15 to 75 lb per day.

Septic Tanks: Three tanks 50×15×10 ft. average depth.

Detention period 6.9 hr at normal flow not including sludge-storage volume. Overflow rate 280 gpd per sf. Sludge storage 3.5 cu ft per capita.

Flow-Measuring Weir: 7½ in. aluminum V-notch weir, ground to knife edge.

Sludge Beds: Two, glass covered, 19×68.5 ft. 1.75 sq ft per capita. To hold 85 percent of volume of one tank.

Sludge Pump: One double diaphragm portable unit. Capacity—9,000 gph at 10 ft lift.

Wash Water: Automatic shallow-well system. Capacity—1,000 gph. at 60 psi.

will be in use from one to four months. This will be governed by character of effluent, accumulation of solids, chlorine demand in the in-use septic tank or a combination of these factors.

The same procedure will be followed in the second and third tanks. Collected solids will be allowed to digest undisturbed for about twice as long as the flowing-through period.

When an operating and digestion cycle is complete, a tank's contents will be pumped to the sludge beds in two stages. The first will remove the supernatant liquid and most watery sludge from a suction pipe opening at about the tank's mid-depth. This will continue until scum appears. The second stage will draw off sludge from the hopper and will continue until the tank is empty.

Scum and sludge will be jetted into the hopper with a one-inch hose fitted with a ¼ in. nozzle.

• Minimum mechanization – The plant has an absolute minimum of mechanical equipment. This small community cannot afford the services of a full-time, trained operator needed to look after mechanized processes. This is the reason why conventional separate sludge-digestion was not adopted for this project.

Imhoff tanks were also ruled out because of the cost of deep wet excavation adjacent to the river or of pumping total sewage flow.

The plant is designed for operation with a minimum of supervisory attention to give a good-quality effluent. The septic tanks are modified to get maximum simplicity of operation and yet to eliminate—as far as possible—the bad features of many early installations.

As a result of this simplicity, the district has contracted with a local caretaking organization to furnish labor for plant operation—for a cost reported to be less than $1,000 a year.

• Officials—The sewers and treatment plant were built by E. B. McGurk, Inc. of Hartford. The 30,000 ft. of sewers cost about $159,000 on a unit-price contract. The plant was constructed for a lump-sum bid of $81,900. Land acquisition, engineering and legal fees and miscellaneous costs amounted to an additional $20,000.

E. I. Damon was chairman of the Commission under which the project was built. Other members were: W. J. Robinson, MD., town health officer and original sponsor of the project; A. G. Goettler; B. S. Hanson; W. J. Harrington, and H. W. Sargent.

Buck & Buck were the engineers and John W. Grigley was chief resident inspector during construction.

Turkey Borrows Funds To Build Ports, Silos

Turkey will start a $38,000,000 port development program immediately with the help of a $12,500,000 loan from the International Bank for Reconstruction and Development.

The loan was based on a report submitted last February by Knappen, Tippetts, Abbett Engineering Co., of New York. The report was prepared by Eugene E. Halmos, chief design consultant, who acted as port consultant for the bank.

Turkey's ports are badly overloaded and need improvement. The country has 4,450 miles of coastline with few natural harbors. Projects include:

1. Acquisition of a construction equipment pool to accelerate and reduce the cost of improving ports;
2. Construction of a new pier and basin at Salipazar, on the Istanbul waterfront, to give Istanbul a berth capable of taking large freighters;
3. Construction of new berthing facilities at Haydarpasa, on the Asiatic side of Istanbul harbor for general cargo and to service grain elevators to be built under a grain storage project;
4. Construction of a new wharf and new berthing facilities at the port of Izmir on the Aegean, which will handle general cargo as well as service the newly-projected grain elevator;
5. Construction of a new port at Samsun on the Black Sea, on which Turkey now has no natural harbors, to open up an economically rich hinterland in central and eastern Anatolia;
6. Improvement of port of Iskenerun on the Mediterranean to facilitate handling of coal and chrome ore and service the projected grain silo;
7. Replacement, reconditioning and repair of existing equipment and the addition of new operating equipment in these and other major Turkish ports to increase their efficiency.

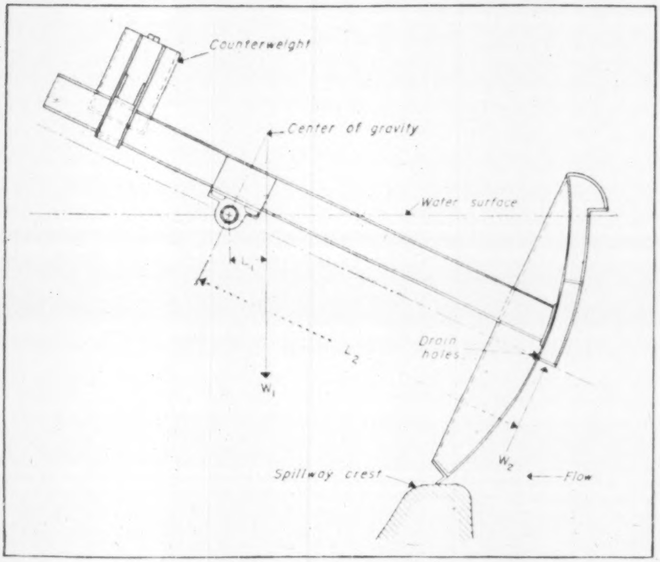


FIG. 1. FORCES ACTING ON THE GATE designed to provide automatically for holding the pool back of the gate at a constant elevation.

New Type Radial Crest Gate Maintains Constant Water Level

A RADIAL CREST GATE installed recently on an irrigation canal in Colorado incorporates automatic control features that are new to the United States. This gate was built to designs developed at the Neyrpic hydraulic laboratory at Grenoble, France.

The gate is installed across an opening in a wall forming one side of the diversion channel by which water for a canal of the Farmers Reservoir & Irrigation Co. is taken from Clear Creek near Golden, Colo. It keeps the level of water in this channel at the maximum safe limit for the canal, opening automatically to discharge excess water back into the creek below the diversion point when the level of the creek rises above the safe level as a result of flood flows.

Important details of the design of this gate are shown in Fig. 1. When a gate of that type is being installed it is first balanced with the arms in a horizontal position by moving the filled counterweight toward or away from the supporting pins. This is done with no water against the face of the gate. When properly balanced, there should be a slight tendency for the gate to close.

With the gate in closed position, water is allowed to rise in the pond to the level at which it is to be maintained. By means of bolts at each end, the counterweight is raised or lowered until the gate has a slight tendency to open. The gate then is ready for operation, and thereafter will maintain the predetermined water level upstream from the gate.

The forces acting on the gate to bring about this automatic control also are shown in Fig. 1. As the upstream water level rises the force W_2 acting on the submerged side of the cell formed on the upper part of the face of the gate increases and the opening moment W_2L_2 becomes greater than the closing moment and the gate opens. As the water level falls as a result of the opened gate, the closing moment overcomes the opening moment and the gate lowers.

The variable in the opening moment is W_2 (L_2 being constant), and the variable in the closing moment is L_1 (W_1 being constant). The opening and closing moments may become equal at any point since W_2 decreases as the gate rises and L_2 also decreases. If the water level tends to be lowered as a result of too much discharge, the closing moment becomes greater than the opening moment, and the gate lowers. Thus W_2 decreases, the gate lowers, W_2 begins to increase as L_2 increases and the moments become equal with a smaller discharge and the water level upstream remains constant.

As a precautionary measure, the cell on the face of the gate is provided with a second surface against which an uplift pressure can develop. Normally, this surface is above water level, as shown in Fig. 1, but should the gate stick slightly for some reason, this surface will be submerged and will add to the uplift forces.

These gates are equipped with a hydraulic dashpot to dampen out the effect of oscillations of water surface due to wind or other causes.

License to build these gates in this country is held by the Thompson Pipe & Steel Co., Denver, of which Walker R. Young, former chief engineer of the Bureau of Reclamation, is president.

FIG. 2. AUTOMATIC CONTROL GATE installed on Clear Creek in Colorado being tested to show the delicate balance.

U. S. Runway Pavement Design Defended

Inspection of Canadian fields used as basis for design methods proposed by Norman W. McLeod reveals no support for Mr. McLeod's conclusions that flexible pavement design methods specified by the U. S. Corps of Engineers are ultraconservative. The reasons why are outlined by Gayle McFadden, chief, Airfields Branch, and Thomas B. Pringle, chief, Runway Section, Office of the Chief of Engineers, Washington, D. C., and W. K. Boyd, chief, Flexible Pavement Branch, Waterways Experiment Section, Vicksburg, Miss.

FLEXIBLE PAVEMENT DESIGN methods used by the Corps of Engineers were characterized as "unnecessarily conservative" by Norman W. McLeod, engineer consultant to the Canadian Department of Transport, in a series of articles that began in the April 28, 1949, issue of ENGINEERING NEWS-RECORD. Those articles contained a summary of flexible pavement design methods proposed by Dr. McLeod, which had been presented at meetings of the Highway Research Board and published by the board as Report No. 4B, dated 1947, and No. 4B-1948 Supplement.

Dr. McLeod's methods were based on field studies he had made of pavements on ten airfields in Canada. In his papers before the Highway Research Board and in his articles in ENR he compared them with methods specified in the Corps of Engineers' Engineering Manual and reached the conclusion that the "principal difference of opinion between the United States Corps of Engineers and the engineers of Canada's Department of Transport concerning runway design lies in the fact that Canadian experience indicates that an airplane wheel load of any given magnitude can be carried by a pavement and base course which have only a fraction of the thickness specified by the USED design." He went on to say that designs based on the California Bearing Ratio rating of soaked subgrade samples, as specified in the Engineering Manual, "could not be justified for airport runway construction in Canada."

• Inspection authorized—Because such outspoken indictment of design methods specified by the Corps of Engineers was a matter of considerable concern to the tax-paying American public as well as engineers responsible for such design, a close inspection of several of the Canadian fields by the personnel directly responsible for the Corps' airfield design criteria was authorized. The statements and conclusions that follow are the result of that inspection, which included discussions with the operators of the fields and examination of their records, all of which were freely made available to us.

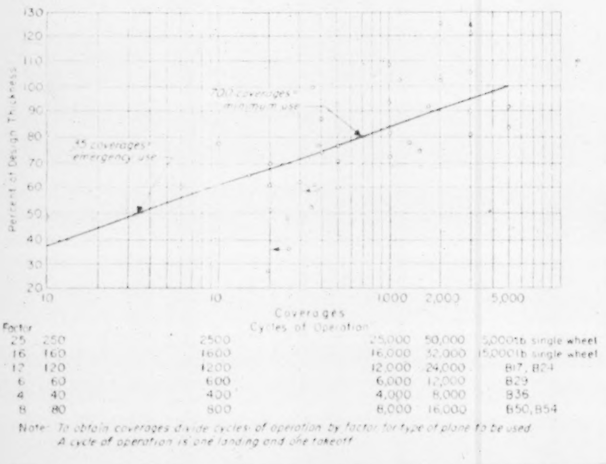


Fig. 1. **PERCENT OF DESIGN THICKNESS** required for various airplane coverages of runways with flexible pavements. Much less thickness is required where the coverages are low.

From a review of Dr. McLeod's published statements it was apparent that the crux of his entire design method hinged about his conclusions that the ten airfields with relatively thin pavements that he studied were successfully supporting substantial traffic of very heavy wheel loads. Consequently, an effort was made to convert his traffic data to a basis that would be comparable to the traffic coverages used in the studies of the Corps of Engineers.

• Traffic data compared—Traffic data for only four of the ten fields he examined were given by Dr. McLeod in his report (Table 1, ENR April 28, 1949, p42). These are Dorval at Montreal, Malton at Toronto, and the fields at Winnipeg and Lethbridge. At Dorval and Malton there are three runways in use and the records indicate that not more than 50 percent of the total traffic is on any runway.

Dr. McLeod's method of presentation makes it appear that he has made a direct comparison of the effect of traffic on Canadian airfields with a similar situation on airfields designed by the Corps of Engineers' method. Such is not the case. An analysis of this method of presenting the data will clearly indicate that the traffic used to prove the contention of "uneconomical pavements" is only "a fraction" of that used to judge Corps

NUMBER OF AIRPLANE COVERAGES BY WEIGHT GROUPS

	Gross Weight of Plane—Pounds			
Airfield	7,500 to 15,000	15,000 to 25,000	25,000 to 50,000	Over 50,000
Dorval		1,000	800	500
Malton	1,500	400	500	100
Winnipeg	1,500	700	300	20
Lethbridge	1,300	300	50	20

of Engineers' standards. In the first place, Dr. McLeod builds up an apparent heavy volume of traffic by indicating the total volume of traffic greater than any given weight. Whereas, if the volume is broken down into weight groups, which is the only logical method of evaluating the load carrying capacity of a pavement, an entirely different picture is presented. Also, Dr. McLeod, in his analysis of traffic volume, uses a takeoff and a landing *each* as a cycle of operation. We do not see how this can be a cycle; however, it is readily apparent that this doubles the Army Engineers' traffic evaluation of a takeoff and a landing as one cycle of operation.

Studies at the Corps of Engineers' Flexible Pavement Laboratory of transverse traffic distribution on runways have made possible the development of the factors shown in Fig. 1, which can be applied to the amount of traffic (cycles of operation) within any weight group to determine the approximate number of coverages of traffic applied to any given runway. When those factors are applied to Dr. McLeod's traffic data they result in the effective coverages for the period 1 Jan. 1942 to 31 Oct. 1946 that are given in the accompanying table. The figures for Winnipeg and Lethbridge assume that 50 percent of all operations occur on one runway.

Another factor that should be considered in the effective traffic that has been overlooked by Dr. McLeod and which does not enter into our computations in the above referenced table is the fact that the subgrades in this latitude are frozen a large part of the year. Canadian Department of Transport engineers stated to the authors that the subgrade is solidly frozen, at Malton about four, and at Dorval about five months out of the year. Since visits were not made to Winnipeg and Lethbridge, no specific data were obtained but it should be safe to assume that subgrades at these locations must be frozen for an equal or longer period of time. Since there would be little or no deflections in solidly frozen ground, the amount of traffic during these months should have little or no consideration in drawing comparison with the service behavior of pavements not subject to these extreme temperatures.

• Many coverages used—In establishing thickness design criteria, studies by the Corps of Engineers were restricted to runways that had been subjected to at least 2,000 coverages of the principal wheel load group using the facilities. This was done to insure against basing such criteria on pavement that might subsequently fail with additional traffic. Also, traffic was continued on all test sections until at least 2,000 and occasionally 5,000 coverages had been applied to make sure that such sections had definitely proved their ability to support such traffic. (The presentation and analysis of data which determined that from 2,000 to 5,000 coverages of traffic are necessary to prove the adequacy of a given pavement thickness are given in Proceedings, American Society of Civil Engineers, January, 1949, p5, "Development of CBR Flexible Pavement Design Methods for Airfields: A Symposium.")

An examination of the amount of traffic sustained by runways at the four Canadian fields listed shows that none have been subjected to as much as 2,000 coverages in any weight group. Further, disregarding the weight group between 7,500 lb and 15,000 lb, it may be noted that if the coverages in all weight groups are combined, only in the case of Dorval will they total more than 2,000.

In the authors' closure to the CBR symposium, which has not yet been published by the American Society of Civil Engineers, an analysis is made of pavement thickness design requirements for limited traffic use. Fig. 1 shows a plot of percent of design thickness versus coverages taken from that closure. The plotted points represent the number of coverages at which pavement failures have occurred under actual traffic conditions when the pavement thickness for these points is expressed in percent of required design thickness. The curve drawn through the points represents a reasonable concept of reduction in pavement thickness that can be taken if the use of the pavement is limited (less than 5,000 coverages). It can be seen from the position of the curve with respect to the plotted points that the reduction allowed is not conservative.

This curve is being utilized to establish criteria for pavement thickness in theaters of operations where the use of a field may be definitely limited to a few months or even weeks. For example, a field designed for emergency use, say 35 coverages, need be only 50 percent and a field designed for minimum use, say 700 coverages, need be only 75 percent as thick as would be required for full or maximum use.

Applying the traffic for Dorval to this curve, it may be seen that the number of coverages listed for the several weight groups warrants its consideration as a field satisfactory for study on the basis of very limited or minimum use. Malton has received insufficient traffic to permit a valid analysis even for limited use. Winnipeg might be considered in the same category as Malton, except that its 20 coverages of planes weighing over 50,000 lb do not justify an analysis for this load even as an emergency field. Lethbridge has still less traffic, while no traffic figures have been listed by Dr. McLeod for the remaining six fields.

• Designed for minimum use—Thus rather than having an economical method of flexible pavement design based on an analysis of ten Canadian fields, it would be more appropriate to say that Dr. McLeod has based his design on one field having sufficient traffic to justify a design for very limited or minimum use.

The data from that field can be supplemented by data from not more than two additional fields, Malton and Winnipeg, which must be used with caution. The data from the remaining fields warrant no consideration since the traffic has not been sufficient to permit valid analysis of pavement thickness requirements to be made. It therefore was considered essential to visit Dorval on the inspection trip and desirable to include Malton since it was in the same geographical area and had received the next highest amount of traffic. Uplands Airfield was inspected only as an incidental part of the visit to Ottawa, the starting point of the Canadian trip.

• Malton runways near failure—Malton Airfield consists of three runways resting on a silty-clay subgrade with an in-place CBR according to Dr. McLeod of about 7. Each runway was originally constructed with a 6-in. gravel base and a 2½ in. asphaltic concrete wearing course. Two of the runways have extensions built at each end which have an 8-in. macadam base and a 2½ in. wearing course. In general, all runways at the time of the inspection were in a state either of incipient or complete failure.

That such a statement is not merely

biased opinion is demonstrated by the fact that reconstruction of one runway was in progress at the time of the inspection (it is understood that a second runway is now being reconstructed). This reconstruction consists of Portland-cement concrete pavement 9 in. thick, placed on a gravel base 17 in. thick at the center and 21 in. thick at the runway edge for approximately the middle third of the runway. The runway ends are constructed of concrete pavement 9 in. thick placed on 13 in. of gravel base.

From Dr. McLeod's report No. 4B, the traffic at Malton prior to 1946 was divided about as follows:

7,500-lb wheel load	75 percent
12,500-lb wheel load	12 percent
25,000-lb wheel load	12 percent
More than 25,000-lb wheel load	1 percent

Data obtained from the traffic manager at the field indicate that the traffic between 1946 and April 1948 was predominantly composed of planes with wheel loads of 12,500 lb or less. During this latter period, Department of Transport engineers indicated that the field began to show distress. Since April 1948 the Canadian plane, North Star, with a dual wheel load of 40,000 lb has been making scheduled stops at the field, and the field has deteriorated rapidly.

It is believed on the basis of these traffic statistics that the field was properly designed for the 7,500-lb wheel load, was somewhat inadequate for wheel loads of 12,500 lb, and grossly inadequate for dual wheel loads of 40,000 lb. If Dr. McLeod's in-place CBR value of 7 for the field is accepted, the Corps of Engineers' design would evaluate these runways as capable of supporting 7,500-lb wheel loads.

It is interesting to note that Dr. McLeod, in Table 7 of Report 4B-1948 Supplement, indicates that at Malton a minimum thickness of 7.5 in. of base and pavement would be adequate to support a 15,000-lb wheel load. However, in a letter dated 7 Oct. 1949, written in reply to a question by the inspection party, Dr. McLeod evaluated Malton runways as satisfactory for wheel loads of but 8,000 lb for capacity operation, but without explanation for the considerable difference in his figures.

It certainly does not appear in this case that Canadian experience justifies pavement thickness designs "but a fraction of that specified by the Corps of Engineers."

• **Conditions at Dorval**—Construction plans in the office of E. L. Davis, district airway engineer at Dorval, indicate that the three runways there consist of 6 in. of pit-run gravel, 5-in. macadam base, and a 2½-in. asphaltic-concrete wearing course. A 1-in. layer of rock dust also was placed on the subgrade to stabilize its upper portion. In a few isolated places on the field there were evidences of incipient subgrade distress marked by pavement cracking and local settlement, but in general the runways were in excellent condition at the time of the inspection. There was definite evidence that this condition had been achieved by exceptionally good maintenance. Mr. Davis stated that maintenance on the field was heavy, and he has recommended that the runways be strengthened by increasing the pavement thickness. From a historical viewpoint, construction plans were examined dated 22 June 1942 for the replacement of the north ends of the NE-SW and N-S runways, respectively, with Portland-cement concrete. These replacements were necessary due to failure of the pavement ends in the area where the planes warmed up and took off. Construction plans dated 14 July 1944 show repairs at numerous places on the NE-SW runway, with lesser amounts on the N-S and E-W runways. It should be noted that the repairs indicated pavement failures sufficiently extensive to necessitate the award of a contract for the work.

An analysis of the traffic data at Dorval airfield indicates that the wheel load producing failure in the period to 1945 was probably about 25,000 to 30,000 lb. Dr. McLeod, in his letter of 7 Oct. 1949, evaluates Dorval as being satisfactory for wheel loads of 22,000 lb for capacity operation. By the Corps of Engineers design criteria the ends of the runways would be satisfactory for single wheel loads of 14,000 lb (27,000 lb for dual wheels), while the interior would be satisfactory for single wheel loads of 18,000 lb (34,000 lb for dual wheels).

Although Dr. McLeod's evaluation of 22,000 lb is considerably higher than this tentative evaluation (the exact in-place CBR value being conjectural), the difference is not unreasonable and scarcely supports claims that the Corps employs an extremely conservative design policy.

• **Excessive Maintenance**—It is possible that much of the differences that exist between Dr. McLeod's and the Corps of Engineers' design tests with the degree of maintenance and runway failure that can be considered tolerable. To point up this apparent difference of opinion, reference is made to page 126 of report 4B, where Dr. McLeod states: "Both Mr. Keith and one of his principal assistants state that there is no knowledge of a plane at any time breaking through the pavement of a runway proper at any station on the route. . . . Even at Edmonton, contrary to popular report, no heavy plane ever broke through the pavement on the original runways proper. Heavy planes did break through the pavements when standing on taxiways and aprons at three of these airports.

By referring to Fig. 1, it can be seen that a pavement having only 50 percent of the required design thickness can be expected to carry a very definite amount of traffic and one so thin as to allow a wheel to break through represents a failure condition so grossly exaggerated as to require no consideration whatsoever.

Pavements designed simply to prevent wheels breaking through or which require constant major maintenance replacements and repairs are not considered desirable by practicing engineers; rather, the design criteria adopted by most engineers are predicated on maximum utilization of a facility for a considerable period of time with only nominal repairs and such maintenance as surface seals, crack filling, etc. Dr. McLeod, however, states "For our part, we are inclined to question the wisdom of endeavoring to base runway design on nominal maintenance for a 25-year period, since it is doubtful that runway requirements can be forecast that far into the future."

It would appear from the foregoing statement that there is a basic difference in design criteria established by the two methods and in no wise implies that Dr. McLeod has developed a new, economical design method. The public should be informed that it is not possible to get something for nothing and that pavements constructed but a fraction as thick by Dr. McLeod's method also have but a fraction of the life expectancy of pavements constructed by other criteria when subjected to equal conditions of load and traffic. This is not to infer that failures by the Corps of Engineers' method are nonexistent; there have been many of them, most of which have been analyzed and utilized in developing presently advocated design criteria.

• **Use of soaked CBR specimens**—So far in this discussion nothing has been said about the differential CBR values found by Dr. McLeod when he compared in-place subgrade tests with tests on laboratory-compacted and soaked specimens. It has been explained carefully in a previous discussion of Dr. McLeod's paper and in an ASCE symposium that the validity of the CBR design curves was established on the basis of in-place tests, which is to say that if the actual subgrade CBR value is known, the thickness of base and pavement required to prevent subgrade failure can be determined for any wheel load or combination of multiple wheel loads with reasonable accuracy. These in-place values must be estimated at the time of the design and the only expedient known to the writers at this time is to perform tests on laboratory-prepared specimens of the subgrade soil.

The soaking tests was adopted to simulate as closely as possible the worst possible condition of subgrade moisture accretion that might be anticipated. Where there is sufficient evidence to prove that the soaked test is not realistic, it is not required.

It is freely admitted that the correlation between field in-place and laboratory test is not always good and effort is being made constantly to improve test techniques so as to bring the two values in closer relationship. In general, however, it is the experience of the authors and their associates that carefully performed laboratory tests will supply data from which a reasonable design can be prepared.

A significant item which was developed during the inspection of the Canadian fields was the very definite opinion expressed by many of the Canadian Transport engineers to the effect that rigid pavement is superior to flexible pavement. This only can be interpreted as meaning that Canadian experience with flexible pavement has not been good. Certainly if flexible pavement was more economical and was found to give satisfactory performance, there would be no reason to prefer Portland-cement concrete pavements. Perhaps a more conservative design which would have eliminated many of the early pavement failures would have prevented this sentiment from developing.

In conclusion, it is the opinion of the writers that Dr. McLeod's presentation of "an economical method of flexible pavement design" was premature, since it was based on an inadequate amount of traffic and on fields that had been in service too short a period of time. The records of maintenance at Dorval, and the complete reconstruction at Malton would infer that Dr. McLeod's method of design rather than being economical is indeed a costly method. The inspection developed no information which would indicate a less conservative approach to the design of flexible pavements than that employed by the Corps of Engineers.

The writers wish to express their sincere appreciation for the courteous manner in which they were received by their Canadian hosts. Representatives of the Royal Canadian Air Force, the Royal Canadian Engineers and the Canadian Department of Transport, both at headquarters and in the field offices, spared no effort in placing at the writers' disposal the facilities of the Canadian Government to expedite the inspection and gather all desired information. Dr. McLeod accompanied the party on all inspection trips and took part in all discussions with Canadian officials. It is regretted that his views and those of the writers should be so divergent in the matter of flexible pavement design.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill)

Bond to Secure Payment

Where a surety gives a bond which provides among other things for the "payment of all labor and material furnished to the contractor," a subcontractor who furnished labor and material to the general contractor, although not a party to the contract, has the right to sue on the bond.[1]

(1) Ramsay & Gatlin Const. Co. v. Vincennes Bridge Co., 50 F. 2d 660, citing Ramsay & Gatlin Const. Co. v. Vincennes Bridge Co., 283 U.S. 796, 51 S. Ct. 484, 75 L. Ed. 1420.

Time for Performance

The rule is well settled that where no definite time for the performance of a contract is specified, the law implies a reasonable time under the circumstances in contemplation by both parties at the time of the formation of the contract.[1]

(1) Calcasieu Paper Co., Inc., v. Memphis Paper Co., 222 S.W. 617. Potter v. Leitenberger Mach. Co., 70 A. 2d. 300.

Modification of Contracts

"All preliminary negotiations, conversations and verbal agreements are merged in and superseded by the subsequent written contract, and unless fraud, accident or mistake be averred, the writing constitutes the agreement between the parties, and its terms cannot be added to or subtracted from by oral evidence."[1]

The parties to a written contract may agree orally to waive any of its provisions.[2] In the case in which this question was at issue, action was brought against the contractor to recover damages for breach of contract, the owner claiming that the foundation installed by the contractor was different from that called for by the terms of the written contract.

At the trial the contractor attempted to show by oral testimony that, after the contract was entered into, the contractor made an inspection of the site of the work and concluded that the type of foundation called for by the contract was inadequate and consequently had called this to the attention of the vice-president of the owner corporation, who approved the contractor's proposal to construct a different type of foundation.

The trial justice refused to permit such testimony, claiming that it tended to vary the terms of a written contract by oral testimony. He rendered a judgment in favor of the owner, but that judgment was reversed on appeal, the appellate court holding that the testimony was not an attempt, by oral testimony, to vary the terms of a written contract but was introduced to show a waiver by the owner of one of the contract's provisions.

The appellate court pointed out that a waiver or novation may be made by oral agreement, also that no matter how stringently the contract may be worded, it is always open to the parties to agree orally or otherwise, upon proper consideration, that the contract's provisions shall be partially or entirely disregarded and another arrangement substituted.

The New York Court of Appeals has defined a waiver as an intentional and voluntary surrender of a contractual right and does not require or depend upon a new contract or new consideration. The waiver having once been made, cannot be recalled or expunged.[3]

(1) Molloy v. Brown, 70A. 2d 336

(2) Van Dusen Aircraft Supplies, Inc. v. Terminal Const. Co., 70A. 2d 65 (Supreme Court of New Jersey, Dec. 19, 1949.)

(3) Alsens American Portland Cement Works v. Degnon Contracting Co., 222 N.Y. 34.

Allowance of Interest

As a general rule, where the amount demanded as payment for work done or materials furnished is liquidated, or can readily be ascertained by computation, interest should be allowed from the date when, by the terms of the contract, payment should have been made. While there may be no express contract to pay interest, there is an implied contract to do so.[1]

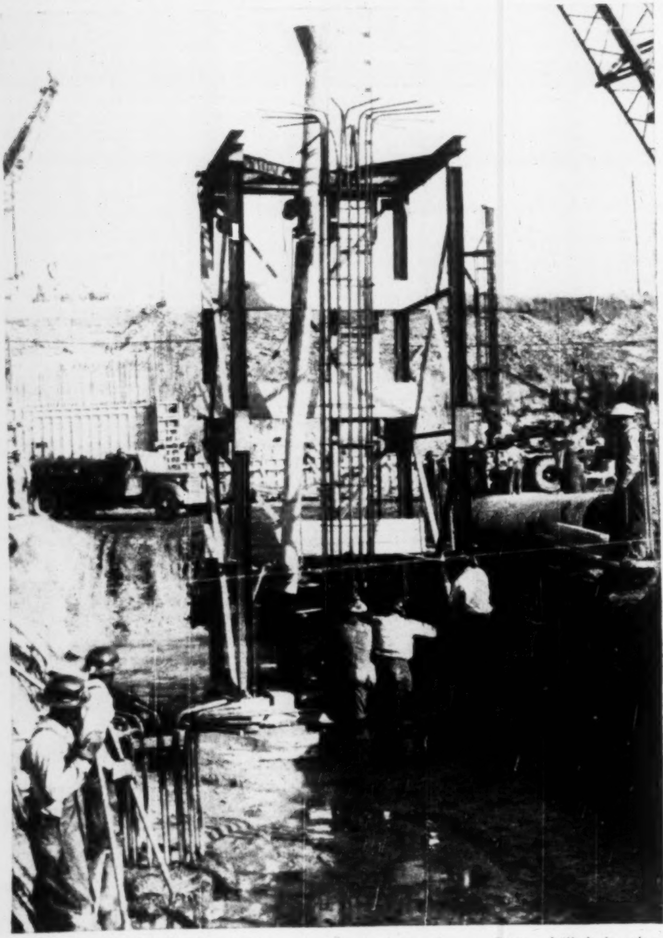
(1) Bischoff v. Francesa, 56 S.E. 2d 865 and cases there cited.

Anchor Cells Hold Down

BUILT-UP BIT in rotary drill perfected by contractor breaks its way through chert leaving rough-walled hole.

REINFORCED CONCRETE anchor cells –220 of them– will hold down the first four units of TVA's $98,000,000 Johnsonville steam power plant. Some $400,000 was saved by resisting uplift with the cells instead of by using increased foundation mat thickness for the purpose.

Foundation construction is virtually finished, and structural steel erection has been progressing at about 80 tons per day so that boiler installation could start on schedule–Aug. 1. A tough timetable has first power production due to start Oct. 1, 1951. Design is under way for units 5 and 6.



REINFORCING CAGE weighing one ton is centered over 30-in. drill hole, then lowered in by crane. Structural steel frame supports tremie pipe through which anchor cell concrete is placed. Workmen in left foreground stand alongside completed cell.

Bedrock is chert. It's solid; it's hard; but it's water-bearing. And the six-unit, 750,000-kw plant sits right alongside the Tennessee River's Kentucky Reservoir, where a 50-ft head can be expected to buoy the building up during high water.

To balance this uplift with dead weight would have meant adding 50,000 tons to the concrete foundation mat, increasing its depth about 8 ft.

Instead, designers called for drilling of 220 holes 30-in. in diameter, 19 ft into the chert. Into each hole went about one ton of reinforcing steel and an average of 5.6 cu yd of concrete to form an anchor cell. Vertical steel projects 5 ft 3 in. from the cells, tying the foundation mat to them. Field tests on holding power influenced cell design.

• Anchor cell construction–Nine different types of reinforcing cage were used in cells under different sections of the structure. But variations were only in number and bending of vertical bars. Cells have either 8, 10, or 12 1½-in. square bars tied with ½-in. rounds at 18-in. centers. Steel projects straight out of some cells; it is bent 90 deg. 3 ft above the others.

Reinforcing cages were completely fabricated, then placed in holes by crane. A portable steel frame, also manageable by crane, was built to support a 20-ft tremie pipe for filling holes with concrete. This frame was moved from hole to hole, following placement of reinforcing.

Construction of the anchor cells was easy–after the holes had been drilled. But, drilling in the chert was troublesome.

Chert is a flint-like rock of organic, sedimentary origin that can be excavated by shovel or bulldozer without blasting, but not without wear: Shovel teeth and scraper blades required replacement after as few as five hours work on foundation excavation. And the hard but crumbly chert was not much easier on drilling tools.

Several types of bit were used in the 4,600 ft of holes–with both churn and rotary drilling equipment.

TVA forces started the drilling last fall, using a truck-mounted rotary drill with auger bit and a tractor-mounted churn drill. The churn drill bit was altered for the job: Cutting angle of the teeth was increased by building them up with stainless steel, hardened with high carbon steel on cutting edges. Average cost of drilling is about

Foundation (And Costs)

$12.50 per ft for holes drilled to date.

Experience on the job indicates that perhaps the best method of drilling TVA tried was this: Laborers dug a 2-ft starter hole; an auger drill with helical-type bit took it down to 5 ft; a churn drill finished the hole, with water used to keep drilled material in suspension and mucking done by a suction bailer; the auger drill then cleaned out the finished hole.

On Oct. 17, H. W. Peerson Drilling Co. of Birmingham, Ala., contracted to drill 115 holes—totaling 2,185 ft. It developed a rotary star bit that proved successful.

The four-winged star bit on the churn drill actually broke, rather than drilled, its way through the chert. There resulted a bore with rough, uneven walls—just right for providing the needed bond to keep the anchor cell from pulling out of the hole.

The anchor cells are strictly for tension. In fact, those directly below the turbo-generators—where loads are heaviest—are designed so they can't possibly carry a downward load when equipment is installed. Concrete of these cells (there are four under each unit) was cut away for 12 to 18 in. from their tops, and a cushion of loose fill was placed for that depth. A ½ in. cork filler was put over this loose material before foundation concrete was poured.

Steel bars projecting from these particular cells were bent 30 deg from vertical so that they won't be able to carry a downward load. They will simply bend further when a load comes upon them.

Cost per anchor cell, including drilling, reinforcing and concrete, averaged about $530.

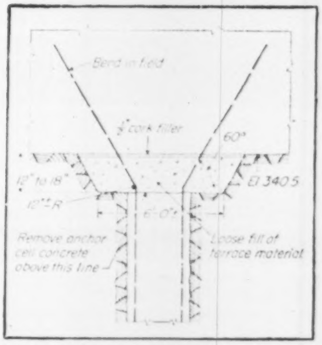
Water-bearing bedrock was the reason for the anchored foundation, but water was not much of a problem during construction. Normally, only 400 gpm had to be pumped to keep the work dry; during heavy winter rains, as much as 3,600 gpm had to be pumped.

• **Dimensions and quantities**—Foundation mat dimensions are 380x240 ft; thickness varies, averaging 8 ft. The building will rise to 17-story height above foundation.

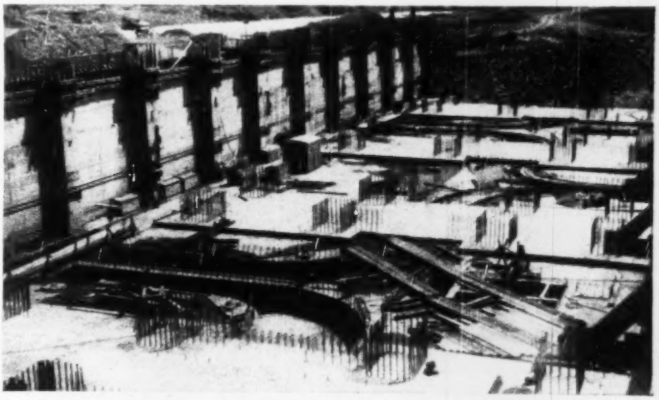
There are 43,000 cu yd of concrete in the foundation, 45,000 cu yd in the whole powerhouse. About 4,000 tons of reinforcing steel and 10,000 tons of structural steel—most of which is to be delivered by barge—will go into the building.

River barges will also deliver most of the coal the plant will use. So a 9-ft deep harbor, 3,600x1,000 ft must be built with provision for unloading to a 30-acre area for storage of 1,000,000 tons of coal. Each boiler in the plant will burn about 54 tons of coal and make 1,000,000 lb of steam per hour when it is operating at normal capacity.

Rail deliveries will supply a sizable part of the plant's 100-carload-per-day coal demand, so 12 miles of track must be laid within limits of the 575-acre site. The Nashville, Chattanooga and


Bend in field
½" cork filler
60°
12" to 18"
El 340.5
12"±R
6'-0"±
Remove anchor cell concrete above this line
Loose fill of terrace material

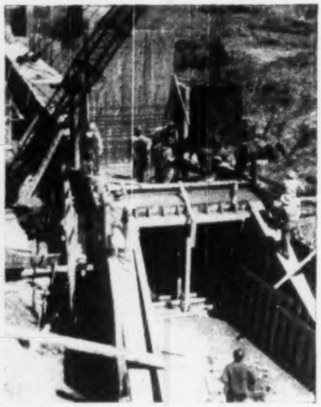
NO COMPRESSION POSSIBLE—To be sure cells under turbo-generators won't act as columns, designers cushioned them.



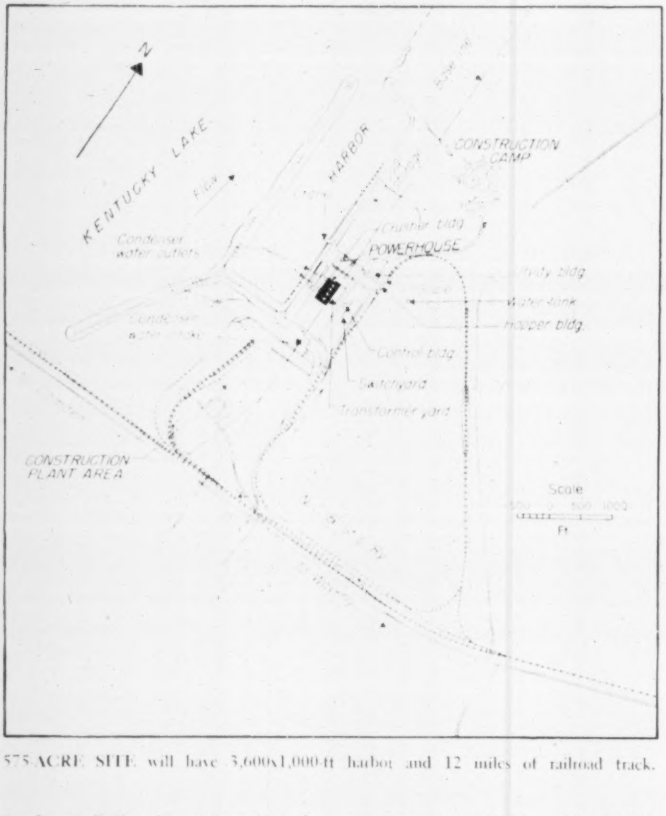
FOUNDATION MAT averages 8 ft in thickness and is tied down by anchor cells. Foundation walls are buttressed outside. This view looks toward the expansion end of the plant where units 5 and 6 will be built.

78-IN. INTAKE PIPES will deliver condenser cooling water to the units. Three are finished; the fourth is started. Sub-contractor has plant right on the job-site for casting of the sections of this conduit.

DISCHARGE CONDUIT—a cast-in-place rectangular section—runs from building, under the service bay to the river.



OUTLET END of conduits discharging condenser water will be at harbor. Stop-log guides are built in for maintenance.



575-ACRE SITE will have 3,600x1,000-ft harbor and 12 miles of railroad track.

St. Louis Railroad mainline bounds the plant property on the south.

Johnsonville is located where east-west Route 70 crosses the north-flowing Tennessee River—just 75 miles west of Nashville.

The plant is TVA's largest effort in steam thus far (ENR June 22, p 124). And with over 700 men on the job, it is the authority's biggest current construction project.

Its six 125,000-kw units (Congress authorized three May 12, 1949, the fourth on Mar. 28, 1950 and 5 and 6 on June 29, 1950) will make Johnsonville the world's second largest steam-power plant. One year's output will be five times the present demand of the city of Chattanooga.

Each unit will be cooled by 79-deg (design temperature) river water brought to it through a 78-in. dia pipe cast in a plant at the site by Lock Joint Pipe Co. Three of the four intakes are laid; the fourth is under construction.

Discharge conduits for returning used cooling water (at about 88 deg) to the river downstream are under construction. These are being built one at a time so that each can be backfilled with earth excavated for the next. They are cast-in-place and rectangular in cross-section.

F. L. Weiss is project manager; Warren McMahan is construction engineer and Hendon R. Johnson, construction superintendent. All construction is under the supervision of George K. Leonard, chief construction engineer. The project design is by TVA's design division, under the direction of Robert A. Monroe, chief design engineer.

Design of the anchor cells and other civil engineering features are under direction of Adolf A. Meyer, chief of the civil design branch. Design and construction are under the supervision of TVA's Chief Engineer C. E. Blee.

ORVWSC Will Coordinate Area Defense Sanitation

Civilian-defense measures relating to sanitation and water supply in the eight-state area covered by the Ohio River Valley Water Sanitation Commission will be coordinated through the Commission's engineering committee. This was decided at a meeting held in Cincinnati July 12.

Dr. John D. Porterfield, a member of the Commission, pointed out that the engineering committee consists of the chief sanitary engineers of the eight states. He called it the logical organization to provide for pooling of ideas and development of plans to cope with emergency water measures.

Meantime, the Commission authorized another investigation of the water quality in the Ohio River at points where the river passes the state lines. This evaluation is designed to provide a measure of progress in pollution abatement. It should also center attention on places where remedial measures must be expedited. The evaluation will be made yearly.

Henry Ward has become ORVWSC chairman. Ward sponsored the act which made Kentucky a signatory to the Ohio River interstate anti-pollution compact in 1940.

BOOK REVIEWS

Highway Capacity

Highway Capacity Manual—By the Committee on Highway Capacity of the Highway Research Board. 147 pp. Published by the Bureau of Public Roads. Available from the Superintendent of Documents, Washington 25, D. C. $0.65.

Information that is basic to the problem of determining the capacity of all major types of highway and streets is packed into this pamphlet of 147 pages. Included are methods for determining the capacities of highway intersections at grade and also where grades are separated, the capacity of weaving sections where highways merge and the capacity of ramps.

Flow through intersections controlled by traffic lights and the effect of parking on capacity also are covered.

The committee has analyzed a mass of information collected by the Bureau of Public Roads, the state highway departments and the Highway Research Board and from it has developed fundamentals to rational design, many of which were not available in the past. Charts and diagrams are used liberally to present much of this information.

Applications of Hydrology

Applied Hydrology—By Ray K. Linsley, Jr., Max A. Kohler, and Joseph L. H. Paulhus. 689 pp. McGraw-Hill Book Company, New York 18, Toronto and London. $8.50.

This book, by three well-qualified hydrologists, will be a useful addition to the library of the hydraulic engineer and the professional hydrologist. It is logically arranged, clearly written and well illustrated.

Charts and diagrams are clear and expressive, with the possible exception of the rather complex pictograph used to illustrate the hydrologic cycle. Those who are qualified to use this book will have no need for a pictograph.

One of the best features of the book is the clear and concise explanation of the climatic and meteorological factors that to a large extent control the hydrology of any region. The chapter on the wind systems of the earth is especially good. The characteristics of snow and ice are well set forth, but one may question the fitness of the word "quality" to define the ice content of snow, as distinguished from water content and water equivalent. Snow has a hundred qualities and there seems to be no need for giving this word a special and highly technical meaning when more descriptive and well-understood English words are available. In scope, the book covers all phases of hydrological science in a wholly satisfying manner.

Considerable use is made of mathematical formulas, but they are used to no greater extent than seems to be necessary. Many hydrological phenomena can be expressed only in the language of mathematics. The various methods of frequency analysis are well explained, but it seems probable that those who have occasion to delve into this branch of mathematics will do well to consult some of the more extensive works listed in the foot notes.

It might here be mentioned that Hazen's treatment of frequency problems seems to apply to rain storms, temperature extremes and other meteorological phenomena, as well as to streamflow.

The book bears the stamp of authority and, in the opinion of this writer, is the best which has appeared since the monumental work of Meinzer and his associates was published some years ago.—Reviewed by Edwin S. Cullings, hydraulic engineer, Watertown, N. Y.

The "Will it Pay?" Question

Principles of Engineering Economy—Third Edition, by Eugene L. Grant. 623 pp. Ronald Press Co., New York, N. Y. $5.

Without changing the fundamental objective of earlier editions of explaining the technique of answering the "Will it pay?" question in engineering situations, the author has rewritten more than two-thirds of this book. Most of the revision was aimed at improving presentation of fundamentals.

Mr. Grant, however, has also added a substantial amount of new material. He has included, for example, a discussion of the currently important topic: treatment in economy studies of prospective price changes. And in a completely new chapter, he considers the basic principles of accounting for income taxes in economy studies.

As in earlier editions, the author continues to emphasize two points:

1. It is prospective differences between alternatives that are relative in their comparison.

2. The fundamental question regarding a proposed investment in capital goods is whether the investment is likely to be recovered plus a return commensurate with the risk.

This book should be of value to engineers in practice as well as to students. Answers are given to about 30% of the 400 problems offered. It is easy reading and presents the subject in an inspiring style.

About Bacteria

Introduction to The Bacteria—By C. E. Clifton. 528 pp. McGraw-Hill Book Co. New York 18, Toronto and London. $5.00.

This new book gives a general introduction to the nature and activities of bacteria. It puts particular emphasis on the more common organisms that most directly influence the welfare of man. The treatment provides a broad background for the general student as well as an understanding into which detailed information can be fitted if the student continues in this field of science.

Sanitary engineers will be particularly interested in four of its chapters: Bacteriology of Soil; Bacteriology of Water; Bacteria in the Air; and The Preparation and Preservation of Food.

About the Roebling's

The Builders of the Bridge—By D. B. Steinman. 457 pp. Harcourt, Brace and Company, New York 17. $5.00.

This is a new edition of D. B. Steinman's widely read book about John Roebling and his son Washington A. Roebling. When that book was first published in 1945, paper restrictions made it necessary to use small pages, which detracted from its appearance and readability. That has been corrected in this new edition. Otherwise the book is unchanged except for a brief epilogue by the author.

New Engineering Books

Subsurface Exploration and Sampling of Soils for Civil Engineering Purposes—By M. Juul Hvorslev. The address of the publisher of this book, The Engineering Foundation, was given incorrectly in the review published in our issue of July 6, p 45. It is 33 West 39th St., New York 18, N. Y. Price $4 to members of the Founder Societies; $6 to others.

Advanced Surveying—By William Horace Rayner. 369 pp. D. Van Nostrand Co., Toronto, London and New York. $4.50.

The Technical Aspect of the Design of Roads—By Stewart Champion. 232 pp. The Technical Press Ltd., Gloucester Rd., Kingston Hill, Surrey, Eng. Price 30s. Obtainable through Stechert-Hafner, Inc., 31 E. 10th St., New York 3.

The Fontana Project—Technical Report No. 12. 706 pp. Obtainable from the Tennessee Valley Authority, Treasurer's Office, Knoxville, Tenn. $2.50.

State-City Relationships in Highway Affairs — By Norman Hebden and Wilbur S. Smith. 230 pp. Yale University Press, New Haven, Conn. $4.00.

The Inelastic Behavior of Engineering Materials and Structures—By Alfred M. Freudenthal. 587 pp. John Wiley & Sons, Inc., New York and Chapman & Hall, London. $7.50.

An Introduction to the Engineering Profession—By John G. McGuire and Howard W. Barlow. 207 pp. Addison-Wesley Press, Cambridge 42, Mass. $3.50.

Eighty Years of Enterprise 1869-1949 A history of the Waterside Works of Ransomes & Rapier. By R. Stanley Lewis. 112 pp. W. S. Cowell Ltd., Butter Market, Ipswich, Eng. Price 10s. 6d.

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READER COMMENT

Concrete Strength and Stresses

Sir: In his interesting letter (ENR June 8, 1950, p. 48) Raymond Archibald seems to imply that the "ultimate" design methods for reinforced concrete developed in the past decade differ basically from the prevailing unit stress methods so widely and generally employed. To the writer it appears that these prevailing methods are likewise based on the ultimate strength of concrete, but are grossly in error because of the assumption that the flexural strength of concrete is identically the same as the compressive strength of that concrete when measured in a 6x12 cylinder.

Why the 6x12 cylinder strength as the direct 100% measure of flexural strength? Does anyone have a defense for this assumption? Put the same concrete in a 6x16 cylinder and a different compressive strength would be measured. Put it in a 6x8 cylinder, there would be a different strength. Put it in a 6x4 cylinder and there would be yet another strength. See Gonnerman, ASTM *Proceedings*, 1925 Part 2, p. 237. So why assume that the 6x12 cylinder strength is exactly the flexural strength? Particularly why, when years ago Slater and Lyse (ACI *Proceedings* 1930, p. 831) found that with 2000 lb. concrete the flexural strength was about 1.75 times the 6x12 cylinder compressive strength; with 3000 lb. concrete about 1.50 times; and with 6000 lb. concrete about 1.40 times.

No more flagrant example of what is euphemistically termed "conservatism" is to be found than in the current AASHO specifications. There, with 3000-lb. concrete, a maximum fiber stress of 1000 psi is permitted, applicable alike to both live and dead loads. By the Slater-Lyse ratio this item yields a safety factor of 4.5. Then with concrete's dead load usually constituting two-thirds to three-quarters of the combined live-dead total, several more units of safety factor are incorporated into the structure. So even if AASHO assumed *loads* involve no safety factor, what of it? Heavens forbid that they should!

The Lake Washington pontoon bridge in Seattle, and all approach structures carry as heavy loads as any bridges in this state. If built today nothing short of H20 S16 loading would be considered for them. Yet in 1938 they were designed for H15 loading only and today they carry traffic quite as effectively as if they had been designed for H20 S16.

Which apparently leads to the conclusion that AASHO concrete specifications needs renovation and modernization. That's correct; they surely do.

HOMER M. HADLEY
Consulting Engineer
Seattle, Wash.

More on Prestressing Safety

Sir: Mr. Archibald raises an interesting point in his letter about safety factors (ENR June 8, p 48). A moot point is whether one should consider a factor relative to objectionable cracking (which cannot be defined) or to collapse. The difference in results depends on many things.

Prestressed beams are designed so as to maintain only a small compression at the lower edge under working loads. Overloading, therefore, will cause cracks—which may or may not be objectionable. But within limits, these will close up when the load is reduced. Generally, there will be no permanent defects if the concrete at the top of the beam has not been damaged and the steel has been elastically, not permanently, strained.

With normal reinforced concrete, fine cracks occur as a result of shrinkage or loading (even without overloading), but for a properly designed and constructed member, they are so small as to be ignored. Cracks in moderately overloaded prestressed beams may similarly be ignored; shrinkage cracks are prevented by the prestressing.

It is common practice in Great Britain to apply an inclusive factor to the total of dead and live loads (by using low working stresses). But, as Mr. Archibald suggests, it would be more logical, in such cases as the conservative highway loading he mentions, to apply a higher factor to the live load than to the dead. This would also apply when it is difficult to assess the load or to anticipate future load. To provide for 1.8 live loads *before cracking* of prestressed concrete occurs is, however, impracticable. It is incorrect to draw any inference from the capacity of normal reinforced concrete to take increased loads before yield, since cracking will have occurred long before.

In the Lee-McCall prestressing system (ENR June 22, p 41), which employs high-tensile bars tensioned in ducts in hardened concrete, calculations and tests show a safety factor usually between 2.6 and 3.0, relative to failure conditions.

C. E. RICHS
DONOVAN H. LEE, *Consulting Engineer*
London, S.W. 1., England

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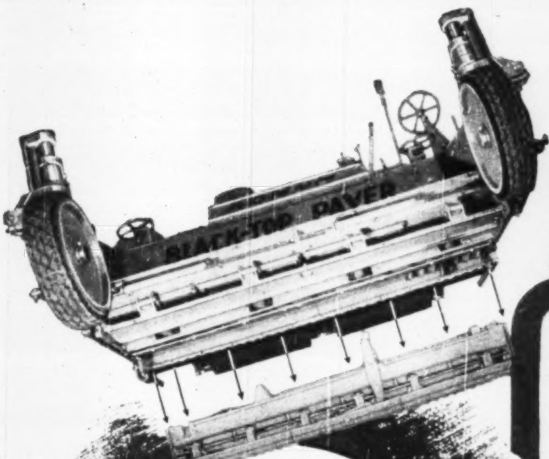

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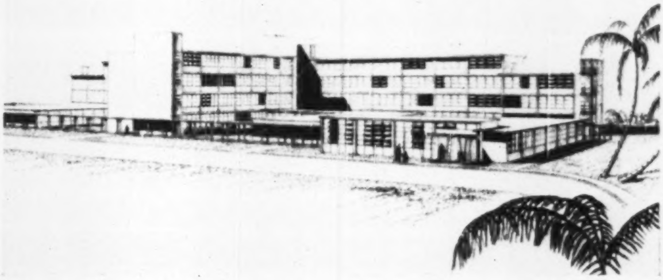
DEVELOPMENTS ABROAD

A 19½-ACRE AUTO FACTORY—Nearly a third of a mile long, this new building will increase the area of the plant of Vauxhall Motors Ltd. at Luton, England, by one-third. To solve the problem of storm-water drainage from the acres of roof, a 5-ft dia. concrete pipeline was installed to discharge the water into the River Lea half a mile away. A tunnel 2400 ft. long had to be driven through chalk hills to accommodate the pipeline. Plans are to replace the present plant with the most modern and efficient production equipment available.



HOSPITAL CENTER—This hospital structure is to be built at Barrio Barrancas, Ponce, Puerto Rico, at an estimated cost of $6,258,000. It is part of a hospital group to cost about $16,285,900. The general hospital will have 400 beds. There will also be a nurses' school and dormitories; athletic facilities, internes' dormitory, director's residence, maintenance superintendent's quarters, executives' apartments, central stores, etc. Materials and equipment will be bought in the U. S. Project is being financed one-third with insular government funds, two-thirds with federal money. Preliminary plans by Isadore Rosenfield have been approved by the Puerto Rican government departments of Health and the Interior.

Funds made available; Rome subway delay over

An appropriation of $4,000,000 has been made for completion of the Rome subway, on which work was suspended two years ago because of lack of funds.

The money now available will be used for final work on the tunnels and stations, installation of operating equipment and purchase of rolling stock.

Meanwhile, in Milan, engineering is completed for the first line of municipal subway, and construction awaits the completion of financial arrangements. One financing plan, offered by an Italian-Swiss firm, is based on an issue of bonds, which would be accepted in payment of town taxes, or for the purchase, at a discount, of season tickets for traveling on the subway.

New cement plant

Brazil—A subsidiary of the Lone Star Cement Corp. has received a $2,070,000 loan from the Export-Import Bank and will add 100,000 tons to Brazil's cement production with a new plant at Salvador in the northern state of Bahia. Large deposits of decomposed coral provide raw material, and natural gas will be used as fuel.

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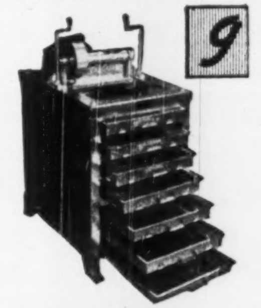

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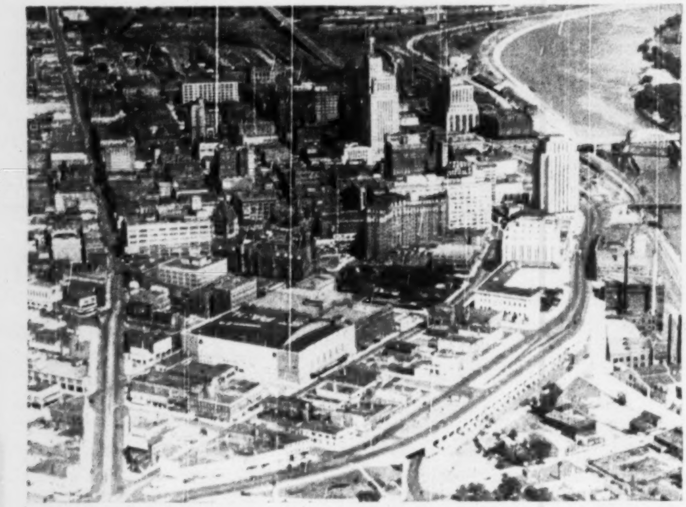


HEAD OF NAVIGATION—In this view of downtown St. Paul, Kellogg Boulevard skirting the Mississippi is shown at the right. In the left foreground, with the air directional sign on its roof, is the Municipal Auditorium, one of the largest and best equipped buildings of its kind in the U. S.

St. Paul, gateway to an empire

Continuing a street modernization program that started more than six years ago, St. Paul, Minn., has just completed a new street lighting system on 25 downtown blocks (ENR June 15, p. 56).

Capital of the state, St. Paul now has 873 miles of paved streets to serve its 350,000 population, and has completed recently a number of boulevards and through streets to speed traffic serving its business areas.

The city has also witnessed a general upswing in office and factory construction.

During most of his lifetime St. Paul was the home of James J. Hill, the Empire Builder, and the city was part of his Northwestern empire. At the head of navigation on the Mississippi River, and the gateway to the Northwest, St. Paul has 925 manufacturing industries and more than 600 distributing and wholesale firms.

The city is proud of its physical appearance. Summit Avenue is one of the finest residential streets in the country. Kellogg Boulevard named after former Secretary of State Frank B. Kellogg, a long time resident of St. Paul, beautifies the waterfront.

The Municipal Auditorium has meeting halls with seating capacities of from 600 to 15,000 people and they are in frequent use.

St. Paul is the home of America's greatest winter sports spectacle—the 9-day St. Paul Winter Carnival—called the Mardi Gras of the North. It starts off with a parade of 25,000 colorfully costumed marchers, viewed by many more thousands of visitors.

Extensive blight study undertaken in Milwaukee

More than 82 blocks in five central wards of Milwaukee, Wis., have been designated by the local housing authority as study areas for eventual redevelopment purposes.

The federal government has earmarked a total of $2,498,000 for redevelopment work in Milwaukee, and, of course, this calls for a lot of detailed study and preliminary planning.

Toledo OK's expressway; Richmond disapproves

The City Plan Commission of Toledo, Ohio has approved a 43-mile system of main expressways for that city, including three new bridges over the Maumee River, to cost an estimated $62,000,000. This is nine miles longer than the system proposed previously by Howard, Tammen, Needles and Bergendoff, Kansas City. Top priority in the 13-section system was given to a new North End bridge and its approaches, to cost an estimated $16,000,000. Planners also advocated a new bridge replacing the present Fassett St. bridge, and a new bridge about one mile downriver from the present Maumee-Perrysburg bridge over the Maumee River.

Recently voters of Richmond, Va., turned thumbs down on the proposed expressway for east-west and north-south traffic through the city. One of the major reasons for the defeat was a lack of definite details on the route of the expressway.

Municipal Briefs

Paving—In Baltimore, Md., 100 miles of city streets are due for resurfacing. The 1950 street program is to cost more than $10,000,000. In Niagara Falls, N. Y. new paving and repaving of streets this summer will cost $773,000.

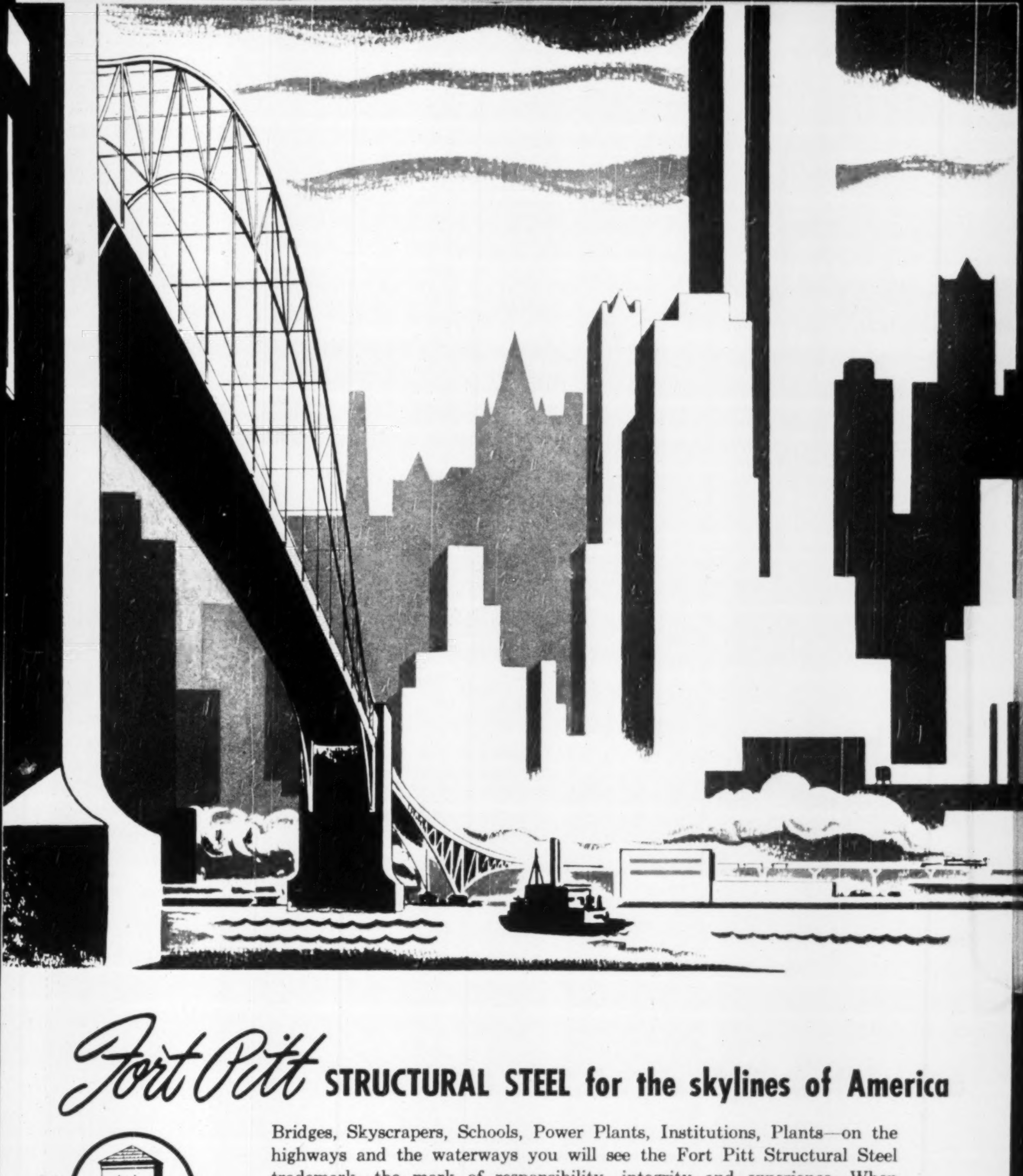
Civic auditorium—The Ford Motor Co. and its dealers have given Detroit, Mich., $2,500,000 to build a 3,000-capacity auditorium in its proposed new civic center. The building will be a memorial to Henry and Edsel Ford.

Redevelopment group—In Pittsburgh, Pa., the Redevelopment Authority of Allegheny County has been organized to condemn and assemble land for low-cost housing, sites for industrial use and commercial development, off-street parking, public building, and playgrounds, and parks.

Pollution survey—A state-wide survey of pollution in public waters has been started by the Ohio Department of Natural Resources, the results to be used as a basis of enforcement of an anti-pollution law passed last year by the legislature. Daily samplings will be made all along Lake Erie's southern shore, and at three locations in the Maumee River and Bay near Toledo. Previously, sampling of the Ohio River water was done by cities along the watercourse for the same purpose.

Civic buildings for L.A.—Clearing sites for two major Los Angeles civic buildings, a $12,000,000 police administration building and a $6,500,000 health center and receiving hospital, has begun and officials said actual construction will begin in June. The police building will occupy two blocks in the downtown area and the health center and receiving hospital will cover another block. Bonds to finance the construction were authorized by voters three years ago.

Park built in a day—Citizens of Kerrville, Tenn. (pop. 6000) built a million dollar park in one working day of 12 hours. About 1,000 volunteers worked on the 35-acre project.



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EDUCATION and RESEARCH

Liberal Arts, Engineering

Case Institute of Technology, Cleveland, Ohio, has entered into an academic partnership with five other middle-western colleges to inaugurate a new curriculum for combined liberal arts and engineering education.

Announcing the plan, designated as the "Binary Curriculum," President T. Keith Glennan of Case said the expanded course, covering two campuses, will provide twin degrees in science and arts.

Ohio institutions combining with Case for the new program are Oberlin College, Ohio Wesleyan University and Marietta College. Out-of-state partners are Coe College, Cedar Rapids, Ia., and DePauw University, Greencastle, Ind.

The "Binary Curriculum" involves three years of study at one of the liberal arts colleges and two years and a summer of work at Case. Following completion of graduation requirements at each institution, students will receive bachelor of arts degree from liberal arts colleges at which they have completed their first three years, and bachelor of science degrees in specialized engineering fields from Case Institute of Technology.

• **Joint study**—A program enabling engineering students to obtain a broad general education before concentrating on a chosen special field of science or technology has been effected by Rensselaer Polytechnic Institute and Franklin and Marshall College. Approval has been given jointly by Livingston W. Houston and Theodore A. Distler, the presidents of the two institutions.

The agreement with the Lancaster, Pa., college is similar to those Rensselaer has made recently with three other centers of the liberal arts — Washington and Lee University, Trinity College and St. Lawrence University.

Under the plan, students may elect to complete three years of the regular liberal arts program at Franklin and Marshall, with emphasis on the basic sciences and mathematics, before entering on two years of specialized study in one of Rensselaer's major departments. After completing certain requirements at Rensselaer, these students will receive the bachelor's degree from Franklin and Marshall. Upon satisfactory completion of the two-year course of study at Rensselaer they will also receive the bachelor's degree in engineering.

Franklin and Marshall was founded in 1787, as the 13th college opened in America, while Rensselaer, started in 1824, was the country's first college of engineering.

Photogrammetry seminar at Univ. of Denver, Aug. 7-11

A photogrammetry seminar, co-sponsored by the University of Denver, and by groups of the American Society for Engineering Education, and the American Society of Photogrammetry is being held at the University of Denver, Denver, Colo., Aug. 7-11.

Discussions primarily will be of photogrammetry and photo interpretation from the viewpoint of education. Teachers of surveying, mapping, agronomy, forestry, geology and related fields will be represented.

Subjects will include course content, position of photogrammetry in the curriculum, prerequisites, instructional equipment, engineering applications, economics of photogrammatic mapping, and ground control and field methods. A tour of the Air Forces Photographic Training School and of the U. S. Geological Survey regional office are included.

PROF. LEON B. REYNOLDS is retiring after 27 years on the faculty of the Stanford University School of Engineering. He specialized in sanitary engineering. Graduated from Stanford in 1909, he began his career in the Burns and McDonnell Engineering Co. of Kansas City, where he was an engineer and partner. In 1923 he returned to Stanford as a member of the School of Engineering staff and has been active in other fields.

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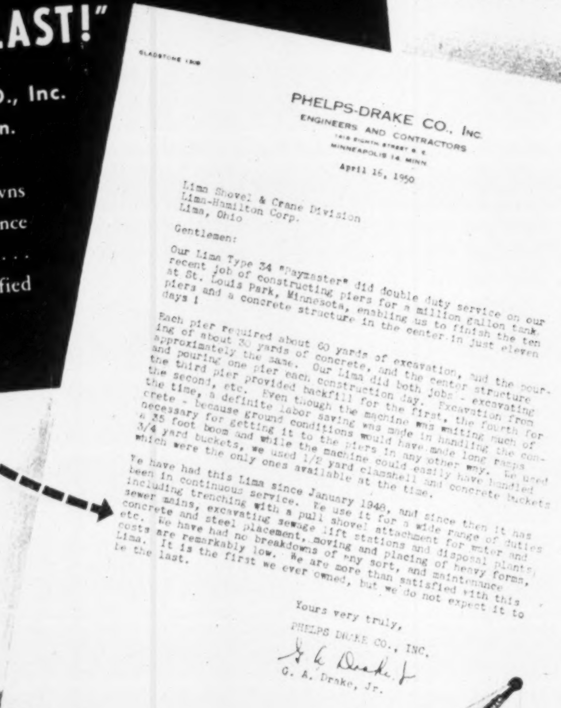
"We have had no breakdowns of any sort and maintenance costs are remarkably low . . . We are more than satisfied with this Lima."

This letter, from a LIMA user, tells in his own words what you can expect of

LIMA
SHOVELS, CRANES and DRAGLINES



GLADSTONE 1308

PHELPS-DRAKE CO., INC.
ENGINEERS AND CONTRACTORS
1418 EIGHTH STREET S. E.
MINNEAPOLIS 14, MINN.

April 16, 1950

Lima Shovel & Crane Division
Lima-Hamilton Corp.
Lima, Ohio

Gentlemen:

Our Lima Type 34 "Paymaster" did double duty service on our recent job of constructing piers for a million gallon tank at St. Louis Park, Minnesota, enabling us to finish the ten piers and a concrete structure in the center in just eleven days !

Each pier required about 60 yards of excavation, and the pouring of about 30 yards of concrete, and the center structure approximately the same. Our Lima did both jobs - excavating and pouring one pier each construction day. Excavation from the third pier provided backfill for the first, the fourth for the second, etc. Even though the machine was waiting much of the time, a definite labor saving was made in handling the concrete - because ground conditions would have made long ramps necessary for getting it to the piers in any other way. We used a 35 foot boom and while the machine could easily have handled 3/4 yard buckets, we used 1/2 yard clamshell and concrete buckets which were the only ones available at the time.

We have had this Lima since January 1948, and since then it has been in continuous service. We use it for a wide range of duties including trenching with a pull shovel attachment for water and sewer mains, excavating sewage lift stations and disposal plants, concrete and steel placement, moving and placing of heavy forms, etc. We have had no breakdowns of any sort, and maintenance costs are remarkably low. We are more than satisfied with this Lima. It is the first we ever owned, but we do not expect it to be the last.

Yours very truly,

PHELPS DRAKE CO., INC.

G. A. Drake Jr

G. A. Drake, Jr.

CAPACITIES:

Shovels 3/4 to 6 yards
Cranes to 110 tons
Draglines variable
Also *Rubber Mounted Cranes* with 20 and 35 tons capacity.

It will pay you to consult your nearest Lima Sales Office or Representative before you buy your next shovel, crane or dragline. Offices in principal cities of the world.

Lima Shovel and Crane Division

LIMA, OHIO

LIMA HAMILTON CORPORATION

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

MEN AND JOBS

Summers Hinshaw, design engineer with the engineering department of the Oak Ridge National Laboratory has retired. He is a 1910 engineering graduate of the University of Tenn., with experience of several years with the Tennessee Valley Authority.

John G. Hendrickson, civil engineer, has joined the American Concrete Pipe Association and the American Concrete Pressure Pipe Association at Chicago as research engineer. After graduation at Princeton he was with the American Bridge Co. until 1939 when he returned to Princeton to teach engineering drawing and elementary surveying. In June, 1943, he entered the Civil Engineering Corps of the U. S. Navy, and served three years as an officer of an underwater demolition team and participated in the landings on Saipan and Tinian in the Marianas, and Leyte and Lingayen Gulf in the Philippines.

Two members of the technical staff of the Illinois state division of waterways have been named to committees to develop data for submission to the Water Resources Policy Commission established by President Truman. They are **W. A. Howe**, civil engineer, who will serve with the group considering flood control and water flow retardation, and **Warren Goodell**, research analyst, on the committee dealing with the land drainage. The commission was created to study and make recommendations to the President on a national water resources policy.

Regional Planning Engineer Stanley A. Kerr, Region II, Bureau of Reclamation, recently retired after 29 years in government reclamation work. Under his supervision, the bureau prepared the Central Valley Basin Report, the prospectus of the water, land, and power resources of the Central Valley. He has served as city engineer for Inglewood, Calif., and as a member of the firm of J. B. Lippincott, consulting engineer in Los Angeles.

An Upper Savannah River office, to control construction work in the area, has been created by the Corps of Engineers with **Fred W. Facey, Jr.**, in charge. The new office will supervise the work at Clark Hill Dam, near Augusta, Ga., and the recently approved Hartwell Dam, further up stream. Mr. Stacey has been resident engineer at Clark Hill.

Lt. Col. Lawrence J. Lincoln, district engineer, Denver district, Corps of Engineers, will be assigned as district engineer, Kansas City, Mo., on July 25. He succeeds **Col. Paul D. Berrigan** who will be transferred to the National War College in Washington, D. C. **Lt. Col. Oliver J. Pickard** will be the new area engineer at Denver. He is assistant executive officer, the Engineer School, Fort Belvoir, Va.

On July 24 Col. **Henry J. Woodbury** became division engineer of the New England division at Boston, Mass. He will succeed Lt. Col. G. W. Carlson, who has been acting division engineer at Boston. Col. Carson will attend the forthcoming session of the industrial college of the armed forces at Washington, D. C. Col. Woodbury has been Western Ocean division engineer at Sausalito, Calif. Maj. Gen. Lewis A. Pick, Chief of Engineers, announced that effective June 30 the Western Ocean division is abolished and its duties and functions will be reassigned to the South Pacific division, Oakland, Calif.

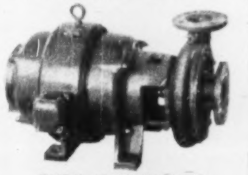
A. S. Gunn, formerly principal assistant engineer of the Canadian National R. R. at Moncton, N. B., resigned and has been appointed inspection engineer for the Trans Canada Highway in New Brunswick.

Edgar D. Hayes, of Little Rock, S. C., a Clemson College graduate who recently obtained his master's degree in sanitary engineering at the University of North Carolina, is a junior public health engineer taking six months of specialized training with the Durham, N. C., Health Department prior to joining the Cabarrus County Health Department at Concord, N. C.

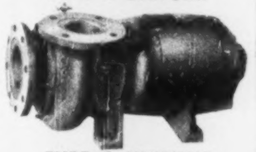
WEINMAN
Unipumps are
COMPACT
for use where space is limited

When WEINMAN engineers designed their Unipumps they took all practical problems into account. Many installations must be made in close quarters which make WEINMAN'S compact design a natural. They are flexible too . . . can be mounted in any position.

Seventy-five year's background and successful experience with one product—Pumps—is at your disposal now. A WEINMAN representative will go over your entire liquid handling operation—application, installation, operation—whenever, wherever you say. Just fill out and mail the coupon below.



TYPE K UNIPUMP



TYPE G UNIPUMP

Capacities to 1000 GPM Heads to 500 ft. ½ to 30 H.P. motors. May be furnished with leakless mechanical shaft seals.

Built by Centrifugal Specialists
The WEINMAN Pump Mfg. Co.
296 SPRUCE ST. COLUMBUS 8, OHIO

Gentlemen
Send a Weinman Centrifugal Specialist to see us ☐
Send us your bulletin describing WEINMAN general service Unipumps ☐
NAME
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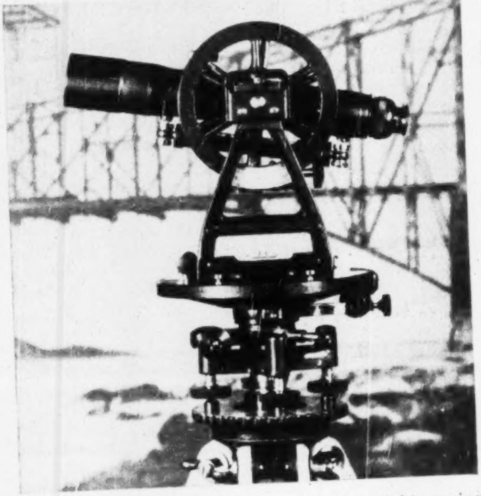
Another technical editor confirms reasons why engineers prefer Gurley Aluminum Transits

Combining durability and lightness with precision for surveying transits

by David W. Veit

Editor, Die Castings Magazine



MANY surveying instruments built by W. & L. E. Gurley, Troy, N. Y., are accurate within one second of arc. If projected, this represents a maximum error of ⅜ inch in a mile.

However, precision is not the only requirement of these instruments. At least three other major factors influence the design and choice of materials for this type of equipment.

In the first place, a surveyor's transit must not only *be* accurate, but must maintain its accuracy over an indefinite period of years despite all sorts of weather and climatic conditions —heat, sub-zero temperatures, dampness, dust or salt-saturated atmospheres.

Second, it must withstand rough usage. This is outdoor equipment subjected to impact and abrasion.

The third requirement — no less important than the other two to the surveyor who carries the transit around all day long —is lightness.

The combination of accuracy and ruggedness could be secured by constructing the transit of heavy-sectioned castings, forgings or fabrications in steel or bronze, extensively machined and elaborately assembled. This choice of materials would, however, fail to include one significant feature—lightness.

The way in which Gurley has been able to combine all three desirable features has been by turning to aluminum for a major group of components. And since aluminum has been picked to fulfill the physical and mechanical needs of these surveyor's transits, it is not surprising that several of the most important parts are being produced most economically by die casting.

Die cast aluminum parts include the truss standard, telescope housing and leveling spider, as well as rod targets and tripod clamps. Aluminum alloys used for these transits have greater stability and rigidity than bronze. In addition, the die casting process permits unitary construction of the mounting frame, contributing further to rigidity.

From the point of view of weight reduction, aluminum die castings have permitted a 25 percent decrease in total weight, as compared with sand cast bronze. Die cast aluminum offers additional weight saving advantage, even as compared with sand cast aluminum, due to the thin, uniform wall section which is practical by die casting.

This pioneering instrument builder has used aluminum die castings wherever possible; this is one of the few production short cuts possible in a manufacturing operation characterized by extensive machining, finishing and assembling operations within close tolerances.

This company has maintained its leadership in the field of engineering and other types of instruments by a willingness to investigate and introduce into their production line the new materials and methods made available by technological advance. The excellent reputation of this company's instruments during the past century is sufficient testimony for the reliability of the materials which they use.

Reprints of the full-length article from which this is reproduced are available on request.

Field-proven over 74 years—Gurley Aluminum Transits are used from the Arctic to the Tropics. In the words of a combat engineer during World War II, "These instruments were subjected to the worst degree of heat, cold, mud, and dust a transit *should not* have. After being dropped, and everything else imaginable, they still did work up to par." The first Gurley Aluminum Transit was retired after 50 years of service to join the exhibit of Gurley "firsts." Gurley Instruments are described in Bulletin 50. Would you like a copy?

GURLEY

Surveying and Scientific Instrument Makers
Since 1845

W. & L. E. GURLEY, UNION PLAZA, TROY, NEW YORK

Surveying and Engineering Instruments, Hydraulic Engineering Instruments, Standard Precision Weights and Measures, Paper and Textile Testing Instruments, Reticle Making Facilities, Aeronautical Navigating Instruments and Meteorological Instruments

ELECTIONS AND ACTIVITIES

James A. Vance, engineer and contractor of Woodstock, Ont., was elected president of the Engineering Institute of Canada at the institute's annual meeting held in Toronto July 12 as part of a joint meeting with the American Society of Civil Engineers.

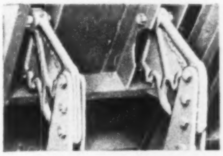
Mr. Vance studied civil engineering at the University of Toronto from 1911 to 1914, leaving in the latter year to take over directions of his father's steel and concrete bridge building business following his father's death. Under his direction the firm has expanded into other fields of construction. He also is an officer of numerous industrial companies in Ontario and owns and operates a 450-acre stock farm.

Mr. Vance joined the institute as a student in 1914. At the present time he is one of the institute's representatives on the Engineers' Council for Professional Development.

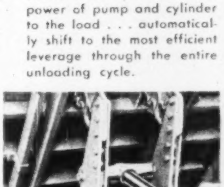
E. O. Turner, dean of civil engineering at the University of New Brunswick, Fredericton, N. B., has been named vice-president of the maritime zone of the Engineering Institute of Canada. He has been on the faculty of the U.N.B. engineering school the past 31 years. R. L. Parsons, engineer and secretary-treasurer of the Parsons Construction Co., Moncton, N. B., is a member of the council of the EIC. He is a graduate of Mount Allison University, Sackville, N. B. and of Nova Scotia Technical College, Halifax, N. S.

FULL
SPEED
AHEAD

GALION *Fulcrumatic*
HOISTS DUMP MATERIALS
FASTER . . . SMOOTHER!



FULCRUMATIC LEVERAGE LINKS smoothly transmit the power of pump and cylinder to the load . . . automatically shift to the most efficient leverage through the entire unloading cycle.



EQUALIZING DOUBLE LIFT ARMS mean balanced lift, elimination of damaging "single point" strain on body or chassis.

Today's fast moving construction schedules demand fast, dependable unloading. Improved Galion *Fulcrumatic* Hoists meet this need with a new load-handling ease. *Fulcrumatic* Lift makes more effective use of pump and cylinder capacity by lifting the load through automatically changing fulcrums. Maximum payloads are handled swiftly, smoothly, and with less effort, less wear on all moving parts. Galion's double lift arms increase truck life, too! "Lift Shock" is evenly distributed throughout the entire truck frame. It will pay you to find how Galion *Fulcrumatic* Hoists can speed your jobs. See your truck dealer or Galion distributor, today.

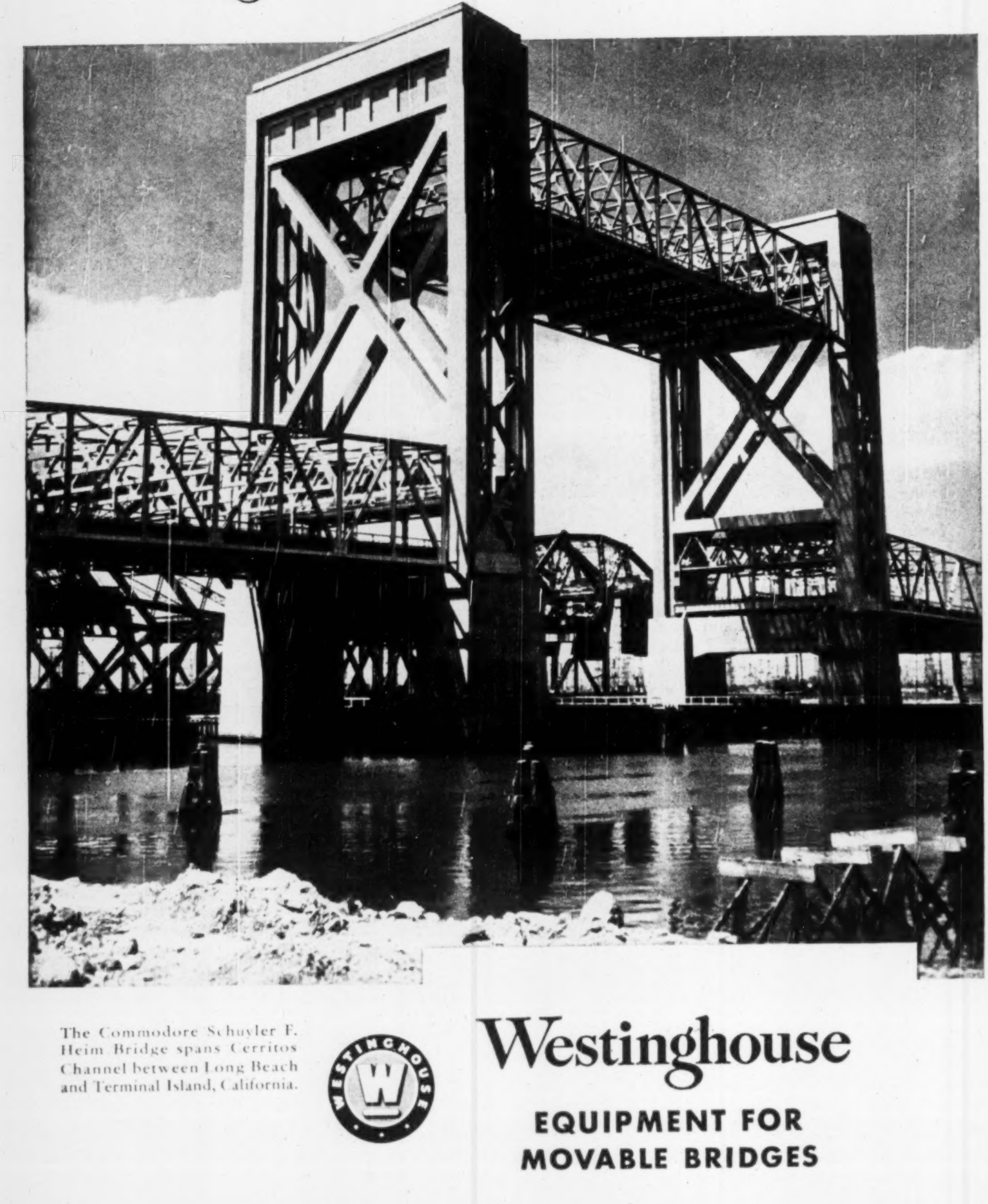
THE GALION ALLSTEEL BODY CO., GALION, OHIO

GALION *Allsteel*

Fulcrumatic HYDRAULIC HOISTS AND DUMP BODIES
TRADEMARK

YOU CAN BE **SURE**.. IF IT'S

Westinghouse



The Commodore Schuyler F. Heim Bridge spans Cerritos Channel between Long Beach and Terminal Island, California.

WESTINGHOUSE W

Westinghouse

EQUIPMENT FOR
MOVABLE BRIDGES

FINGER-TIP CONTROL

ON AN 800-TON SPAN

TOP LIFT SPEED IS 74 FPM

California's Terminal Island Bridge represents one of the most modern applications of electrical equipment in the nation. And it's Westinghouse throughout.

Its many electrical improvements make operation fast and certain. The six-lane traffic span is raised 125 feet in 2¼ minutes. Top lifting speed is 74 fpm, yet the lift is slowed quickly and smoothly to 7 fpm for seating. All 800 tons of the span, reduced to a one-ton lift by counterbalancing, are controlled by the operators finger tips at the main control panel.

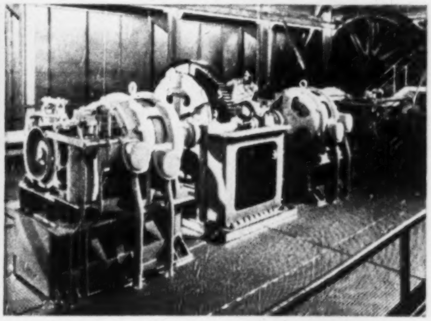
Level raising is assured by two pairs of span hoist and tie motors—consisting of four 100-hp Westinghouse wound-rotor motors in a synchro-tie arrangement. The main switchboard controls these motors and also meters and distributes the incoming electric power.

Westinghouse makes the complete electrical equipment for every type of movable railroad and traffic bridge—from the single bascule to the large vertical lift. With this background, our bridge engineering specialists work with you to save time and insure a co-ordinated electrical system.

If you have CONSTRUCTION AHEAD that includes movable bridges, call your nearby Westinghouse office.

J-94819

800-ton span is raised from this modern, all-electrical main control desk. Indicators on vertical panel show height and level of span; the meters show span speed, motor power load, and direction of power-flow in synchro-tie system. Desk switches include main hoist master-switch, reversing switch and leveling controllers for emergency operation.



In the South tower machinery room, one motor lifts the span while the other motor shown controls rate of lift. A similar team operates in the North tower. In each tower, the lifting cables pass over two drums (far right background). Also shown here are the differential, center, and magnetic brake, far left.

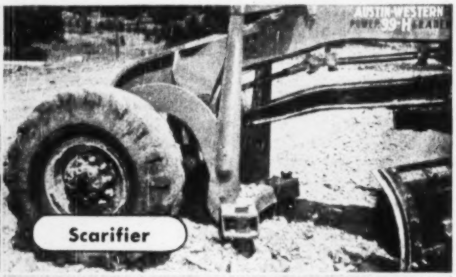
There's Extra Performance in Every Attachment

with ALL-WHEEL DRIVE ALL-WHEEL STEER

Extra performance which increases profits by doing the work faster and better, and reducing investment in part-time equipment. All-Wheel Drive and All-Wheel Steer handle either a front- or rear-mounted attachment with no sacrifice of operating efficiency, where ordinary graders—handicapped by a dead front end and lack of rear steer—would be helpless through loss of traction or directional control.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

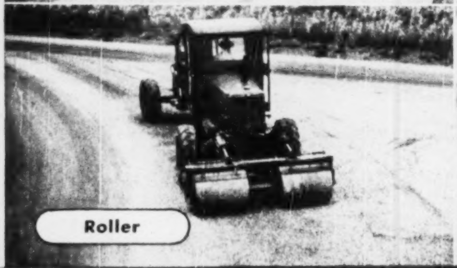
Bulldozer



Scarifier

Loader

V-Plow


Roller

Rotary Plow

BUILDERS OF ROAD MACHINERY
Austin Western
SINCE 1859

OBITUARY

Capt. Ernest Frederick Eggert, 74, U. S. N. ret., who was a member of the U. S. Navy's Construction Corps for many years and was stationed at the Navy Yard in Washington, D. C., from the late 1920's until he retired in 1938, died July 22 in Arlington, Va. He attended the Naval Academy, and served in the Spanish-American War and later was stationed in the Philippines. He directed ship construction at a number of naval bases in this country and was in charge of Navy construction at Newport News during World War I.

Robert L. Lash, 65, who had served with the District Engineers of Florida and was superintendent of construction in the Washington District Corps of Engineers, died July 19 in Washington, D. C.

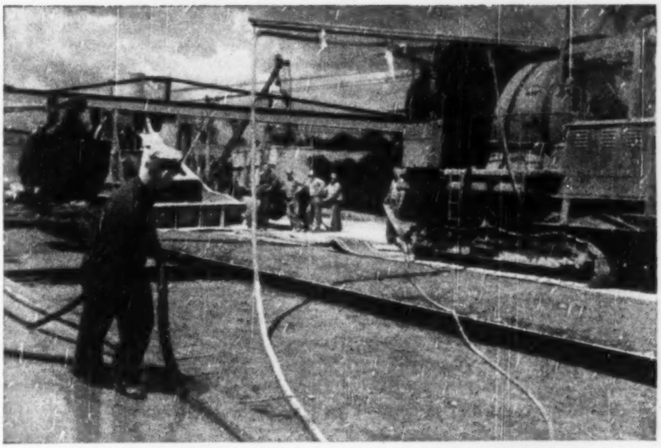
Lawrence R. Hjorth, 62, civil and structural engineer, member of Edwards and Hjorth, New York, died at Calais, Me., July 9, while on a vacation trip. He was educated at the University of Washington and started as a draftsman in the bridge and building department of the Chicago, Milwaukee & St. Paul R. R. Co. In 1933 he became a partner in H. G. Balcom and Associates and remained until the recent formation of Edwards and Hjorth. He had charge of the design of many important buildings, including the Chrysler building, the Waldorf Astoria Hotel, Federal Reserve Bank building and Radio City Music Hall in New York.

Henry Cudroff, 55, since 1941 a structural engineer for Ebasco Services, Inc., New York, died July 16. He was a C. E. graduate of Ohio State University. He had done work for the Chicago and New York world fairs.

Wm. N. Cramer, 65, assistant to the division engineer, Illinois Central R. R. died in Springfield, Ill., July 18. He had been with the railroad for 41 years.

Harry Wilcox, for many years superintendent of construction for the L. H. Shattuck Co., Manchester, N. H., died in that city on July 21. He was born in Queensberry, England, and retired about a year ago.

John A. Johnson, 78, retired highway engineer, credited with the adoption of the cloverleaf design for traffic routing at highway intersections, died at Worcester, Mass., July 24. He at-



READY FOR WORK... *Every Day!*

From ditches to dams, homes to highways, sewers to skyscrapers—no matter what you're building—you've got to have hoses that won't fall down on the job! That's the only kind Hewitt-Robins makes.

WATER HOSE

Take Maltese Cross® Water Hose, for example, for high-pressure, heavy-duty use. Top quality from inner tube to cover, Maltese Cross stays on the job because it's *designed right* and *built right*.

CEMENT PLACEMENT HOSE

Or look at Monarch® Cement Placement Hose. To withstand the cutting action of sand and cement, you'll find an inner tube of *pure gum rubber a full quarter-inch thick!* And we make the carcass so strong no outer cover is needed. That makes Monarch a *one-man hose!*

AIR DRILL HOSE

For hard rock drilling, Maltese Cross Air Drill Hose is "made to order" because it has the great strength and high resistance to hot oil and lubricants so vital in mining and heavy construction service.

For hose that is *always ready to go to work*, call your Hewitt Rubber Distributor (listed in the classified 'phone book), or write Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, New York.

Hewitt-Robins is Headquarters for Construction Hose

Air Hose
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Fire Hose
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Fuel Oil and Gasoline Hose
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Portable Skid Tank Gasoline Dispensing Hose
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Sand Suction Hose
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Conveyor Belting · Transmission Belting · Pipe Slings
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HEWITT-ROBINS
CONSTRUCTION HOSE

HEWITT-ROBINS HR INCORPORATED

In 1950

as in

1900

1889—AUDITORIUM HOTEL AND THEATER, Chicago (now Roosevelt College)
1904—MERCHANTS EXCHANGE BUILDING, San Francisco
1907—PLAZA HOTEL, New York City
1916—FRIARS CLUB, New York City
1924—FEDERAL AMERICAN NATIONAL BANK, Washington, D. C.
Alfred C. Bossom, Architect, NYC
J. H. deSibour, Assoc., Washington
1946—PLAZA HOTEL, New York City
1947—BETHEL CONGREGATION, Phoenix, Ariz.
J. H. Welch & Son, Phoenix
1949—SHAMROCK HOTEL, Houston, Texas
Wyatt C. Hedrick, Architect
Stone & Webster Eng. Corp. Engineers

SHONE® DEPENDABILITY
***Belongs* in "Prestige" Buildings**

TWO GENERATIONS OF LEADING ARCHITECTS HAVE SPECIFIED THE SHONE PNEUMATIC SEWAGE EJECTOR
—knowing that it will do its job for long years to come, quietly, smoothly, efficiently

For automatic, trouble-free handling of crude sewage and waste—30 gpm up to 600 gpm—the famous Shone Pneumatic Ejector is known and trusted throughout the world. Here is a mechanical device which was apparently "conceived in perfection," for since the first Shone was built no change has been made in its basic design—none was needed!

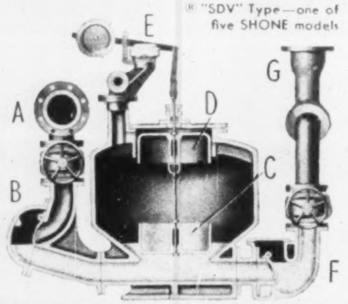
Plus-advantages which have been responsible for the efficiency and dependability of the Shone include:

NO SCREENS OR IMPELLERS • NO SEWER GAS, WET WELL OR DANGER OF EXPLOSIONS • NO AIR-TIGHT SHEET METAL FLOATS OR FLOAT SWITCHES • NO GROUNDS DUE TO CONDENSATION IN WIRING CONDUIT AND SWITCH ENCLOSURES

The Shone requires practically no attention. One Shone operated flawlessly for 25 years in a sealed chamber, and another performed perfectly for many years while submerged in a flooded pit. Shones can be operated from distant compressors—any number from a single compressor plant, or from the building air supply.

SPECIAL DESIGNS FOR UNUSUAL REQUIREMENTS

For complete engineering data, write for Bulletin . Contains Air Volume and Pressure Table, Sizes, Dimensions, Air Piping Layouts, and other comprehensive specifications. Write today on your regular business letterhead.



® "SDV" Type—one of five SHONE models

A Inlet pipe
B Inlet Check Valve
C Lower Bell
D Upper Bell
E Pilot Slide Valve
F Discharge Check Valve
G Discharge Pipe

Yeomans Brothers Company, 1445 N. Dayton Street Chicago 22, Illinois

YEOMANS

PUMPS FOR BUILDINGS, MUNICIPALITIES, INDUSTRIAL APPLICATIONS—
and a complete line of Sewage and Waste Treatment Equipment

tended Massachusetts Institute of Technology, and was named resident engineer with the Massachusetts Highway Commission in 1894, remaining until his retirement in 1941.

Licius Arthur Simms, a former city engineer and city manager of Hopewell, Va., died there July 12.

Harry J. Morrison, 80, for 23 years engineer of federal roads in Florida prior to 1942, died in Gainesville, Fla., July 19. He was a civil engineer graduate of Harvard.

Earl D. McRorie, 69, highway superintendent of the Town of Richfield, N. Y., for 39 years, died July 14. He was superintendent longer than any other highway superintendent in the state.

Andrew B. Ewing, Jr., 58, general superintendent for the Oman Construction Co., Nashville, Tenn., died July 20. He operated his own construction firm in Birmingham, Ala., prior to becoming connected with the Oman company fifteen years ago.

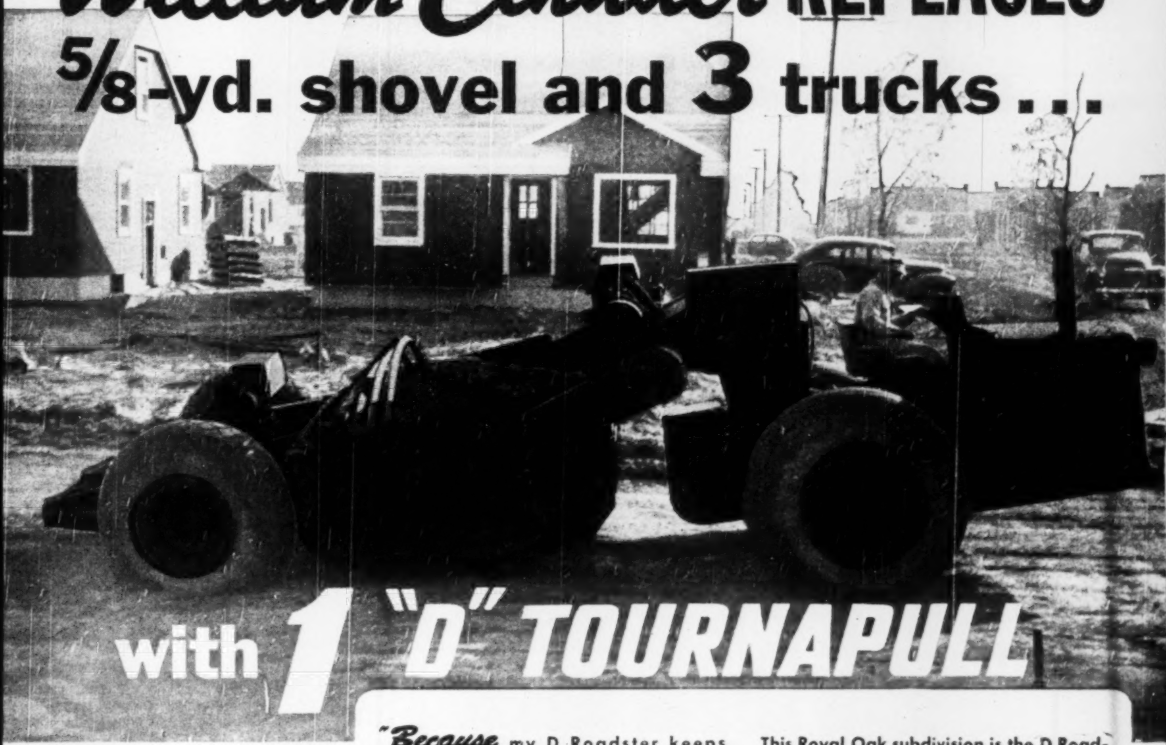
Thomas H. Mullay, 90, died July 17 in Techny, Ill. He was at one time with Yost & Co., Columbus, Ohio, architectural firm, and later went to Chicago to join D. H. Burnham Co., for whom he served as superintendent of construction in the building of the World's Columbian Exposition in 1893. He later was in private practice for nearly 50 years.

Joseph A. Fiorito, 69, veteran contractor of Seattle, Wash., died July 20. Born in Italy, he moved to Seattle in 1907 and five years later founded the Fiorito Brothers Construction Co., which paved hundreds of miles of streets in Seattle and handled some of the largest paving projects in the area.

Ralph Hansen, 53, since 1946 chief of the Soils Foundation and Frost Effects laboratory of the New England division of the Corps of Engineers, U. S. Army, died at Medford, Mass., July 25. He received his early technical education at the Lowell Institute and later attended Massachusetts Institute of Technology as a graduate student. He joined the Corps of Engineers as a soils engineer at Zanesville, Ohio. After experience at Memphis, Tenn., and Little Rock, Ark., he joined the New England division in 1944.

Frank Middleton Miller, 58, former highway contractor in Kentucky, Pennsylvania and New York, died recently after an illness of 11 months.

William Cinader REPLACES 5/8-yd. shovel and 3 trucks . . .



with 1 "D" TOURNAPULL

Power-proportioning differential, positive power steer, and flotation of big, low-pressure tires, keep Roadster rolling over softest footing.

Tournapull Trademark Reg. U.S. Pat. Off. [illegible]

"***Because*** my D Roadster keeps ahead of my gravel trucks . . . and operator carries his own grade . . . I have eliminated a ⅝-yard shovel, 3 to 4 trucks on sub-grade excavation, and one grade foreman. We cut costs . . . get more production . . . more profit . . . have less worry." That's the report from Contractor William Cinader of Clawson, Michigan, who is grading streets and leveling lots for a new 550-home subdivision at Royal Oak.

"D" self-loads . . . hauls, spreads around houses and foundations

Contractor Cinader's 25 m.p.h. D Roadster is moving approximately 25,000 yards of topsoil and clay on the Royal Oak grading job. It self-loads 6½ loose yards in an average of 1 minute. Constantly turning and twisting in tight quarters, the fast, maneuverable rig hauls and spreads among new houses and basement foundations . . . has been averaging 20 trips an hour on 300 to 500' one-way hauls.

This Royal Oak subdivision is the D Roadster's fourth job in three months. It has dug trenches for pilings on building construction at Mount Clemens, Michigan . . . excavated sub-grade for two other city streets in Royal Oak . . . and handled a 3500-yard street job in Birmingham, Michigan.

Works gravel pit weekends

On weekends, this Roadster sometimes does small jobs that build up extra earnings. On one of these assignments recently, operator roaded the rig to a gravel pit near Royal Oak, where it handled a quick stripping job. According to the pit owner, unit did 3 times more work than shovel and trucks, and left exposed gravel in a cleaner condition.

Like Contractor Cinader, you, too, will find D Roadster gives you lowest-net-cost ***and more profit*** per yard. See your LeTourneau Distributor for complete facts . . . or write TODAY.

LETOURNEAU TOURNAPULLS

PEORIA, ILLINOIS

JOB-PROVED
Over 6700 Built and Shipped

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

YOU CAN BE *Sure*

with

penta-
chlorophenol

Guard rails are safe at the ground line with PENTA

When you build roads and highways, plan for that "built-in" safety that PENTA-PROTECTED wood gives your guard rails.

PENTA-PROTECTED wood lasts up to four times longer than untreated wood. It effectively protects wood against termites and decay. The longer durability of PENTA-PROTECTED wood means fewer repairs, less maintenance, greater highway safety. Properly used, PENTA leaves wood clean, paintable and easy-to-handle.

Specify PENTA-PROTECTED wood for guard rails, pilings, loading platforms—in fact for all wood structures where greater permanence and safety are desired. For further information about PENTA and its applications in industrial building, write Dow.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

THE CLEAN WOOD PRESERVATIVE!

SEND FOR FREE LITERATURE about PENTA — *the modern wood preservative.*

THE DOW CHEMICAL COMPANY
DEPT. PE 58A
MIDLAND, MICHIGAN

Name ______ Title ______

Company ______

Address ______

City ______ State ______

DOW

penta-
chlorophenol

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
September Materials and Labor Prices will appear in the September 7, 1950 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots incl. $1.00 per bbl. for bags, cash. dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in., truckload del., per block		CONCRETE Ready Mixed 1:2:4, over 50 c.y., del.
	Cloth	Paper	Bulk	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$4.16	$3.41	$3.10	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.1725	$0.1725	$11.00
Baltimore	....	3.39	3.14	2.40‡a	2.40‡a	1.95‡a	2.60‡a	2.70‡a	2.45‡a	2.45‡a	.16	.16a	10.25
Birmingham	....	3.00	2.68	2.24	2.24	1.84	2.50	2.50	1.00	1.20	.145	.145	7.75
Boston	....	3.67	3.41	2.50a	2.50a	2.50a	1.60a	1.70a	....	....	.196	.205a	10.45h
Chicago	3.99	2.99	2.74	2.75‡b	2.75‡b	3.20‡b	2.75‡b	2.75‡b	2.00‡	2.00‡	.20	.20b	10.20
Cincinnati	....	3.24	3.08	2.00‡c	2.25‡c	1.90‡c	2.00‡h	2.00‡h	1.50	1.50	.19	.205	10.15f
Cleveland	3.83	3.03	2.75	1.90ef	1.65f	1.55	3.55‡a	3.55‡a	2.75‡	2.75‡	....	.22	12.35g
Dallas	3.54	2.74	2.49	2.00	2.15	1.75	2.10	2.15	....	....	.089e	.125	9.30
Denver	....	3.54	3.29	1.85	2.00	1.15	....	....	....	....	.20	.23a	9.65
Detroit	....	2.98f	2.73	3.25‡b	3.25‡b	3.00‡b	3.35/3.50‡	3.35/3.50‡	3.50‡	3.00‡	.18	.19a	9.85f
Kansas City	....	3.13	2.88	1.90	1.90	1.50‡	1.95a	1.95a	....	....	.175ag	.215e	10.40‡b
Los Angeles	....	3.72a	3.32a	1.94‡a	2.04‡a	1.74‡a	1.92‡a	1.92‡a	....	....	.105f	.205	10.01lh
Minneapolis	....	3.43cd	3.17cd	2.30‡ag	2.30‡ag	1.35‡ag	2.40‡ag	2.40‡ag	....	....	.21i	....	10.90fi
Montreal	....	2.56ac	2.41ac	....	2.50hi	2.00i	.85aj	1.10j	....	....	.22	.20a	9.05ek
New Orleans	....	3.05e	2.70e	2.32	2.32	1.82	....	....	1.05	1.25	.25	....	12.40
New York	....	3.49	3.24	2.10bk	2.10bk	1.45bk	2.35bl	2.35bl	....	....	....	....	11.00a
Philadelphia	3.93/4.23‡	3.13/3.43‡	2.87/3.17‡	2.75‡	2.65‡	2.05‡	2.00‡	2.05‡	1.75	1.65	.20/.24	....	11.15
Pittsburgh	3.90	3.18	2.85	2.05‡	2.05‡	2.00‡	2.50‡	2.50‡	2.05	2.05	.21d	.21d	11.00
St. Louis	....	2.99/3.05b	2.80b	2.40/2.60‡am	2.40‡am	2.00/2.40‡am	1.60j	1.60j	1.15	1.15	.215	.25ci	9.40
San Francisco	....	3.39	2.99	1.86	1.86	1.96	1.96	....	....	....	....	.25c	10.75c
Seattle	....	3.55a	3.05a	2.75‡bm	2.75‡bm	2.75‡bm	3.50‡bm	3.50‡bm	....	....	.22i	.3135i	10.25j

‡ Delivered. * Prices incl. dealers comm. except as noted.
CEMENT: *a* Subj. to 10¢ dis. *b* Less 2% for cash. *c* CL price dealers' comm. not incl. *d* Dealers sell only LCL. *e* Plus switching charges. *f* Paying up to $3.80 for cement brought in from outside sources.
SAND, GRAVEL, STONE & SLAG: *a* Truck lots. *b* Per cu. yd. *c* 5 tons or more. *e* ½". *f* Pea gravel. *g* Less 5% for cash. *h* Less than 5 tons. *i* Sales tax incl. *j* F.o.b. quarry. *k* Barge lots asd. *l* F.o.b. scow Hudson river. *m* Less 2% for cash.

CONCRETE BLOCK: *a* Cinder. *b* Waylite. *c* Haydite. *d* Celocrete. *e* 5¾ x 8 x 12 in. *f* 8 x 4 x 16. *g* F.o.b. truck at job. *i* Less 2% for cash. *j* Less 1% for cash.
READY MIXED CONCRETE: *a* 5 cu. yds. or over del. Man. *b* 25 cu. yds. or more. *e* 10-100 cu. brackets. *c* 2,000 lb. concr. *f* 2500 lb. comp. *g* Aver. haul 7-9 mi. zone. *h* Less 50¢ for cash. *i* 5% off for cash. *j* 2% off for cash. *k* Sales tax included. *l* 1:2¼:4. *m* F.o.b. yard.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For cloth bags, add $1.05 per bbl., 25¢ refund allowed for each returnable bag; for paper bags add 25¢ per bbl., not refundable

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn.	$2.40†	Buffington, Ind.	$2.30	Steelton, Minn.	$2.40	Muskegon, Mich.	$2.50†	Toledo, O.	$2.40†
Clinchfield, Ga.	2.40†	Independence, Kan.	2.30	Leeds, Ala.	2.25	Saginaw, Mich.	2.35†	Milwaukee, Wis.	2.40†
Kingsport, Tenn.	2.40†	Hannibal, Mo.	2.35	Duluth, Minn.	2.40	Wyandotte, Mich.	2.40†	Green Bay, Wis.	2.40†
West Des Moines, Iowa	2.45†	Northampton, Pa.	2.40	Hudson, N. Y.	2.40	Buffalo, N. Y.	2.40†	Ironton, O.	2.40
Nazareth, Pa.	2.40†	Universal, Pa.	2.40	Alpena, Mich.	2.25†	Oswego, N. Y.	2.60†	Montreal City	2.21
Bath, Pa.	2.40†	Waco, Tex. (+10¢ tax)	2.30	Detroit, Mich.	2.40†	Cleveland, O.	2.40†	W. Winfield, Pa.	2.40†

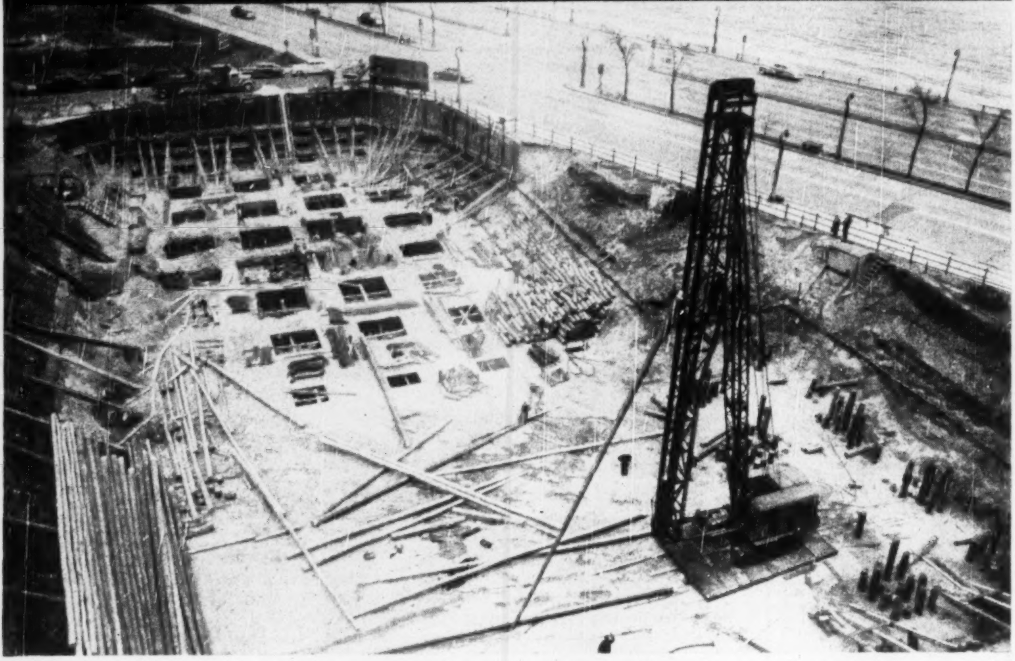
† *Prices to hold for third quarter of 1950.*

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80-300 penetration		CUTBACK ASPHALT Per ton		ROAD OIL	ASPHALT EMULSION (Quick-breaking) Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Per gal. Tank car	Tank car	Drums
Atlanta	$73.00	$35.00	$2.25	....	....	....	....	....	....	....	....	....
Baltimore	150.00‡	57.70‡	....	$21.00	....	$.085	$0.14	$.085	$.16	$.085i	$.085	$0.11
Birmingham	......	32.50	....	....	....	....	....	....	....	....	....	....
Boston	....	....	....	24.50a	$35.50a	.1036a	.185a	.115aw	.205aw	.10a	.113a	.205a
Chicago	155.00‡a	85.00/88.00‡b	2.80/3.40‡f	20.25b	30.25b	19.25br	29.25br	.0875bw	.16w	.075b	....	..
Cincinnati	....	....	....	21.50k	....	.095	.0965	.095w	....	....	....	....
Cleveland	....	51.00d	3.43g	24.00	33.50	24.00r	33.50r	.10w	.22w	.10	.11	.25
Dallas	e	40.00	e	23.95	42.99	.1012	.1898	26.99	47.97	.0987	.1062	.1423
Denver	.....	46.00	.....	....	....	....	....	....	....	....	....	....
Detroit	.....	82.00	.....	26.65	....	12.00v	....	.0976w	....	.0971	....	.197
Kansas City	e	e	e	18.05el	....	....	....	.07ew	.0725w	.061e	....	....
Los Angeles	e	.....	e	12.50dm	....	12.50dv	....	14.00d	....	12.50dv	.0775j	.1575j
Minneapolis	.....	.....	2.83h	25.50	36.00	24.00r	35.00r	24.00	35.00	.09	.12	.22
Montreal	137.00	e	e	27.00n	36.65n	16.70nu	18.50nu	16.30nu	18.30nu	13.20ns	.174n	.215ns
New Orleans	.....	.....	.....	16.50c	....o	16.50cv	o	.08cw	o	.0775	.08	.1425t
New York	.....	.....	2.35f	23.50	35.86q	22.50r	41.88pr	.0940w	.1767pw	.0890	.0940	.1747q
Philadelphia	150.00	110.00	4.06	20.50	....	19.50r	....	.085w	....	....	....	....
Pittsburgh	165.00	42.00	4.50	22.00	35.00	.10	.22	27.00	39.00	.095	.09	.20
St. Louis	.....	.....	.....	19.25f	....	.1633	.....	.0841w	....	.15	....	....
San Francisco	.....	62.75c	.....	14.50g	30.00gp	14.50gkv	....	16.50g	....	....	.08	.14
Seattle	.....	.....	.....	14.50h	35.00h	15.00hv	.....	.165hw	.205hw	16.00hv	.08h	.09h

‡ Delivered.
PAVING BRICK & BLOCK: *a* CL. *b* 3½ x 4 x 8½. *c* 2¼ x 8½ x 4. *d* LCL, truck deliveries. *e* Not used. *f* 2" interior 6# treat. *g* 3", 8# treat.
ASPHALTS: *a* Price at plant, Everett, Mass. *b* F.o.b. refinery, Lockport, Ill. *c* F.o.b. Sugar Creek, Mo. *d* F.o.b. refinery, El Segunda. *e* F.o.b. Baton Rouge. *f* F.o.b. Wood River or Roxana, Ill. *g* F.o.b. Richmond, Calif. *h* F.o.b. Martinez. *i* Bulk refinery. *j* F.o.b. refinery, Englewood, Calif. *k* 50-110 penetr. *l* Less than 100 penetr. *m* 40-80 penetr. *n* Tax incl. *o* Drums not avail. *p* Shipped in steel bbl. *q* Use of used drums. *r* In customer's drums. *s* Shipped in drums, per drum. *t* 55-gal. drums. *u* Per 100 gal. *v* Per ton. *w* Per gal.

LAKE SHORE FOUNDATION PRESENTS
A TOUGH DEWATERING PROBLEM . . .



$4,600,000 Apartment on Lake Michigan's Shore — Chicago — Contractor: B. W. Handler Construction Co., Chicago, Illinois

WHY TOUGH?

Picture 25 feet of water in fine silt, sand and clay, laminated, with clay at subgrade. To lower the water table in these various strata to the clay layer was our problem.

HOW HANDLED?

One Moretrench pump, with one spare pump, and 140 carefully installed wellpoints made short work of it. Deepest pits at -21 were bone dry.

No matter what or where your wet job is, we're interested. Contact our nearest office for an estimate on working with MORETRENCH — quickly, economically — "in the dry"!

MORETRENCH CORPORATION

90 West St.
New York 6

4900 S. Austin Ave.
Chicago 38, Illinois

7701 Interbay Blvd.
Tampa 9, Florida

315 W. 25th St.
Houston 8, Texas

Rockaway
New Jersey

Canada: Geo. W. Crothers, Ltd., Leaside (Toronto) Ontario

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT. SHAPES—PLATE	REINF. BARS billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle Bars	Std Spikes	Tie Plates	Track Bolts
Birmingham Area	$3.40	$3.45	$7.25		$68.00	$75.00	Not	$4.40	$5.60	$4.20	....
Chicago Area	3.40	3.45	7.25	$4.20	68.00	75.00	avail-	4.40	5.60	4.20	....
Pittsburgh Area	3.40	3.45	7.25	4.20	68.00	75.00	able	4.40	5.60	4.20	....
Buffalo Area	3.45	3.45	7.25	4.20	68.00	75.00	....	4.40	5.60	4.20	$8.85
Cleveland	....		7.25	....	.....	.....	....	....			8.85
Youngstown Area	....	3.45	....	....	.....	.....	....	....	5.60		....
Geneva	3.40		....	....	.....	.....	....	....			....
Los Angeles		4.15	....	....	.....	.....	....	....	5.60		....
Pueblo	3.40	3.45	....	....	68.00	75.00	....	4.40	5.60	4.20	8.85

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price u 5 tons to carload lot b New billet	Rail steel	Add switch	$ cwt for Del	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING d Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires
Atlanta	$5.83	$5.65	$5.65	$.025	$.10	$31.50	$31.50	A.P.M.* Joliet, Illinois, Donora, Penn., $2.46 F.o.b. Mill: Monessen, Penn., $2.46	A.P.M.* Joliet, Illinois, Donora, Penn., $1.75 F.o.b. Mill: Monessen, Penn., $1.75	A.P.M.* Joliet, Illinois, Donora, Penn., $2.58 F.o.b. Mill: Monessen, Penn., $2.58
Baltimore	6.09	5.09d			.10	40.00	43.00			
Birmingham	5.40‡	5.25	5.25	.05	.15	42.00p	44.50p			
Boston	5.75k	5.56k	5.56ke	....	.10/.15	32.00	34.50			
Chicago	5.25	4.50ff	4.50ff	.0625	....	32.00‡	34.50‡			
Cincinnati	5.79r	5.54r		....	....	34.00ee	36.50ee			
Cleveland	5.37	4.47r	....	....	.10	34.00‡	36.50‡			
Dallas	6.75	5.45	5.45	....	....	43.50	46.00			
Denver	6.65	6.75e	....	....	....	48.00s	57.00gg			
Detroit	5.84‡	5.59n	....	....	.10	37.00	46.00			
Kansas City	5.65nn	5.50e	....	....	....	35.50	38.00			
Los Angeles	5.90fhh	5.70g	....	....	.15	38.00f	40.00fk			
Minneapolis	5.61hh	6.12ll	6.12ll	....	.15	34.00	36.50			
Montreal	6.75i	4.75i	4.75ij	....	....	44.10h	46.80h			
New Orleans	....	5.40ck	....	.05	.10	38.50	41.00			
New York	5.65r	5.58	5.33	....	.20	35.50t	38.00t			
Philadelphia	5.45	5.60	....	....	....	35.50‡	38.00‡			
Pittsburgh	5.20-5.30	5.20-5.30	....	....	.10	32.50	34.00			
St. Louis	5.58	4.44c	4.44c	....	....	42.00aa	48.00aa			
San Francisco	6.00ii	5.75l	....	....	.15	37.50	40.00			
Seattle	4.95ii	5.35l	....	....	....	52.00mm	42.00mmx			

* At Producing Mill.

‡ Delivered. b 1–5 tons, add 35¢. Less than 1 ton, add 50¢. c 20 tons or over base. e F.o.b. plant. f Includes delivery in free delivery zone. g 10,000 to 39,999 lbs. h List price. Dominion tax exempt. Provincial and Municipal tax extra. i Plus Dominion, Provincial and Municipal sales tax. j Price per ton. k F.o.b. city. l Intermediate and hard grade new billet. m Per sq. yd. n 5–10 tons. o 5 to 15 tons base. p Del. of 5000 sq. yd. or less. q Std. ribbed, 4 lb. per sq. yd. r 5 tons or over. s LCL. t Asphalt coated. u Note: Revised size extra—1 in., 1¼ in., 1½ in., 10¢. ⅝ in., ½ in., 15¢. ⅜ in., 25¢. ¼ in., 50¢. ¼ in. 80¢. ⅛ in. $1.90. v 20 tons. Straight. w Copper bearing. x 2.5 lb. per sq. yd. y $0.0063 transportation tax included. z Copper alloy. aa Delivered truck to job. Contractor to do unloading. dd F.o.b. dock. ee F.o.b. cars. ff Carload lots. gg Including sales tax. hh 10,000–19,999 lbs. ii Rolled at Geneva mill. 400–3999 lbs. kk 2" ribbed. ll 5 to 8 tons. mm 2% off for cash. nn 10 tons or over.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b., 6 in. to 24 in. a	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4-24 Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered; ASTM C14-41 12 in.	24 in.
Atlanta	$89.50	$0.43	$0.67	$3.39	$7.00	$114.00	$140.00	$0.45	$2.00
Baltimore	93.86	.455	.8775	3.69	9.94	159.00	240.00	.85	2.35
Birmingham	82.50	.40	.72	2.84		210.00‡	375.00‡	.90	2.50
Boston	102.46	.413ux	.8235uxy	3.60uxy	10.00uxy	173.00	267.00	1.45‡mp	3.60‡mp
Chicago	96.49	.54	1.08	4.25	13.25	150.00‡	270.00‡	.70	2.35
Cincinnati	94.90	.476	.918	3.87	10.25	148.80‡	230.70‡	.60m	2.25m
Cleveland	97.13	.40x	.783x	3.33x	9.1225x	140.00	219.00	.72m	2.75m
Dallas	99.28	.365	.657	2.63	6.25			.49	1.60
Denver	104.36	.41dd	.71dd	2.98dd				.74dd	2.5dd
Detroit	92.13	.63	1.21	4.86	13.12	210.00m	330.00m	.75	3.00
Kansas City	98.41	.413m	.76m	3.00		215.00		.65	2.25
Los Angeles	111.06	.468l	.927l	4.532l	11.298l	212.30	342.00	.72	2.05g
Minneapolis	94.86, 100.67	.62mo	1.12mo	4.55mo				1.29h	3.67h
Montreal	90.00	.77z	1.35z	4.47z	7.23z			72.00kaa	218.00kaa
New Orleans	92.68	.453	.82	4.41	8.85*	235.00bb	412.00bb	.65	2.29
New York	97.80, 102.50	.58	1.10	4.40	11.99			1.00	2.50
Philadelphia	90.47	.55	1.65	4.15	10.75	240.00‡	300.00‡	1.35h	3.40h
Pittsburgh	97.76	.36m	.70m	2.70m	6.625m	147.50	230.00	1.05h	2.50j
St. Louis	94.27	.50	.92	3.80	9.00			1.10l	2.45hl
San Francisco	111.06	.55d	1.08d	4.68d	11.70d	195.00dd	325.00dd	.69	2.85
Seattle	112.95	.51b	.91b			150.00e		.80ee	2.40ee

*WROUGHT STEEL PIPE

(Full standard weight)

Mill	2½ & 3 in. Butt Weld† Black %	Galv. %	3½ to 6 in. Lap Weld† Black %	Galv. %
Lorain, Ohio	48.0	33.0		
Aliquippa, Pa.	48.0	30.0	43.0a	21.5a
Sparrows Pt., Md.	46.0	28.0	40.0	21.5
Benwood, W. Va.	48.0	30.0	42.0c	23.5c
Youngstown, O.	48.0	30.0		
Indiana Harbor, Ind.	47.0	29.0	40.0	21.5
Sharon, Pa.	48.0	29.0		
Wheatland, Pa.	48.0	30.0	43.0a	24.5a
Etna, Pa.	48.0b	30.0b	42.0ab	23.5ab
Fontana, Calif.	37.0b	19.0b	31.0ab	12.5ab

† Threaded and coupled. a 3½ to 4 in. b Continuous weld. c 5 and 6 in.

‡ Delivered. a B. & S. class B and heavier, CL. Burlington, N. J. (base) $87.50. Based on existing freight rates; subject to rate change. Gas pipe and class A, $5 per ton additional. 4 in., $5 per ton additional. 30 in. and larger, usually $1 per ton less. b Extra strength ASTM C 200-44T. c 4-in., $90. d SS361-A. e 30 in. g Culvert pipe. Reinforced, ASTM C76-41. h Reinforced. ASTM C75-41. i Reinforced. ASTM C76-37. j Centrispun. k Per 100 ft. l F.o.b. plant. m Truck delivery. o Listed price is based on LCL (no minimum). p Less than 5 tons, per price per ft. t Within switching limits. u ASTM C13-40. v F.o.b. city. x 2 ft. lengths. y 3 ft. lengths. z CESA A 60-1941 specifications used. aa No standard specification in Can. bb Freight allowed to destination in city. cc Truck loads; f.o.b. plant, Newton. dd LCL, delivered, f.o.b. truck. ee 1% off for cash. * Not stocked, only made to order. ff 21".

* WROUGHT STEEL PIPE. Discounts from standard list consumers carload prices. Base price approx. $200 per net ton. List prices per ft.: *Butt Weld* ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. *Lap Weld* 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Freight rates to destination to be added to price plus 3 percent tax on transportation.

WROUGHT IRON PIPE: List prices per ft. same as wrought steelpipe. Discount for Pittsburgh base. *Butt Weld*—1 in. and 1¼ in. black, + 10.5, galv. + 33.0; 1½ in. black, 4.5, galv. + 29.5; 2 in. black, 4 galv. + 29.0. *Lap Weld*—2½ in. to 3½ in. black + 11, galv. + 32.5; 4½ in. to 8 in. black + 8, galv. + 28.0. Freight rates to destination to be added to name delivered price.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimension, planks, No. 2. Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

LONG LEAF Y. P. Merchantable grade up to 20 ft.

PLYWOOD Rail freight increment (See note for base price)

		1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 R/S	6x12 R/S	12x12 R/S	Long Leaf 2x12 R/S	Long Leaf 12x12 R/S	Plywood 5/8"	Plywood 3/4"
Atlanta	†	**$71 00**	**$74 00**	**$66 00**	**$68 00**	**$72 00**	**$75 00**	**$75 00**	.....				$22 32	$27 24
Baltimore	*	**70 00**	**77 50**	**72 50**	**72 50**	**72 50**	**73 00**	**86 00**			**$145 00**	**$148 00**	22 86	27 90
		109 00g	*109 00g*	*109 00g*	*109 00g*	*109 00g*	*109 00g*	*109 00*	*$99 75*	*$99 75*				
Birmingham	†	**83 00**	**85 00**	**63 00**	**71 00**	**77 00**	**85 00**	**85 00**			**115 00**	**125 00**	21 78	26 58
		80 00	*80 00*	*77 50*	*77 50*	*80 00*	*80 00*	*81 00*	*81 00*	*81 00*				
Boston	*	**86 00**	**86 91**	**91 00**	**91 00**	**91 00**	**96 00**	.....			**114 00**	**114 00**	22 86	27 90
	§	*110 00*	*93 95*	*105 00*	*110 00*	*110 00*	*110 00*	*110 00*	*110 00*	*110 00*				
Chicago	**	**96 98**	**97 99**	**88 90**	**97 98**	**102 103**	**105 106**	**105 107**			**125 130**	**125 130**	18 72	22 80
		110 111	*112 113*	*115 116*	*115 116*	*117 118*	*115 117*	*115 00*	*117 119*	*117 119*				
Cincinnati	*	**103 20**	**103 80**	**103 80**	**103 60**	**103 60**	**115 20**	**126 00**					21 78	26 58
		96 00	*98 00*	*96 00*	*96 00*	*96 00*	*98 00*	*96 00*	*170 00*	*170 00*				
Cleveland	**	**95 00**	**97 00**	**90 00**	**95 00**	**95 00**	**100.00**	*105 00*	*105 00*	*105 00*			22.20	27.12
Dallas	k†	**63 00**	**70 00**	**61 00**	**53 00**	**56 00**	**57 00**	**90 00**			**86 00**	**88 00**	18 72	22 80
Denver	*	*Not in stock*		*128 00*	*128 00*	*129 00*	*127 00*	*116 00*	*138 00*	*130 00*		...	13 92	16 98
Detroit	‡	**96 00**	**98 00**	**85 00**	**92 00**	**96 00**	**96 00**				**97 00**		21 78	26 58
			107 00	*107 00*	*107 00*	*107 00*							.....	.....
Kansas City	*	**112 00**	**119 00**	**125 00**	**122 00**	**126 00**	**128 00**	**138 00**					16 56	20 16
		112 00	*119 00*	*127 50*	*125 00*	*127 00*	*130 00*	*140 00*	*135 145*	*135 145*				
Los Angeles	1	*103 00*	*103 00*	*101 00*	*101 00*	*101 00*	*101 00*	*113 00*	*128 00*	*113 00*			13 38ab	16 26ab
Minneapolis	§	*125 00*	*125 00*	*130 00*	*130 00*	*130 00*	*130 00*	*140 00*	*140 00*	*140 00*			16 56	20 16
Montreal	ab	75 00	79 00	75 00	77 00	80 00	89 00						.....	.....
		160 00	*160 00*	*160 00*	*160 00*	*160 00*	*160 00*		*160 00*					
New Orleans	†	**80 00**	**83 00**	**79 00**	**80 00**	**83 00**	**85 00**	**100 00**			**135 00**	**135 00**	18 72	22 80
	†	*76 00*	*78 00*	*80 00*	*80 00*	*80 00*	*77 50*	*77 00*	*76 00*	*70 00*				
New York	2	**110 120**	**115 125**	**110 120**	**110 120**	**120 130**	**125 135**	**135 140**			**210 240f**	**210 240f**	22 86	27 90
				Range from $125.00 to $135.00				*125 135*	*125 135*	*125 135*				
New York	**	**100 00**	**102 00**	**82 00**	**100 00**	**102 00**	**105 00**	**110 00**						
		100 00	*100 00*	*114 00*	*114 00*	*114 00*	*114 00*	*116 00*	*116 00*	*116 00*				
Philadelphia				**Range from $105.00 to $115.00**				**105 115**			**180 00**	**180 00**	22 86	27 90
				Range from $120.00 to $130.00				*120 130*	*130 140*	*130 140*				
Pittsburgh	†	**85 90**	**85 90**	**85 90**	**85 90**	**85 90**	**90 100**	**100 110**			**100 110**	**120 130**	22 56	27 48
	†	*90 100*	*95 100*	*95 100*	*90 100*	*90 100*	*100 110*	*120 130*	*100 110*	*120 130*				
St. Louis	ac	**103 50**	**109 00**	**94.25i 98.75h**	**98 75d**	**106 50e**	**116.25d**	**121.75l**					18 72	22 80
	ac			*124i 130.50j*	*130 00e*	*130 00e*	*129 50e*	*136 00e*		*130 00*			.....	.....
San Francisco	**	*65 00*	*65 00*	*67 00*	*66 00*	*66 00*	*65 00*	*65 00*	*65 00*	*65 00*			10 08a	12 30a
Seattle	†	*85 00g*	*85 00g*	*85 00g*	*85 00g*	*85 00g*	*85 00g*	*85 00g*	*85 00g*	*85 00g*				

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. § Retail, LCL, deliv. 2. Deliv. truck lots. 3. F.o.b. asd.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* a Spruce. b Tax exempt. c 5M lots. d 8-12 ft. lengths. e 8-16 ft. lengths. f 18 ft. or under. g No. 1 common. h 10-12 ft. lengths. i 8 ft. lengths. j 10-16 ft. lengths. k No. 3 common. l 14-16 ft. lengths.

PLYWOOD: Special concrete form grade Fir Plywood, 4' by 8' panels 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft surface. Seattle base price on 5/8", $187.00; on 3/4", $214.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. a Lower rate by water shipment. b 50,000 lb. minimum.
* Freight rate increase of 6c per cwt., not included in these figures.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Thickness A quality	 B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	76%e	76%e	$0.2025
Baltimore	80-10%	82-10%	.2025
Birmingham	83%	83%	.1575
Boston	83%	83%	.2025
Chicago	81%	81%	.2025
Cincinnati	81%	81%	.2025
Cleveland	81-10-10%	81-10-10-10%	.2425
Dallas	75%	75%	.215
Denver	83-5%	83-5%	.2075
Detroit	81-10-10%	81-10-10%	.2025
Kansas City	83-10-10%	83-10-10%	.2075
Los Angeles	56%	61%f	.21
Minneapolis	80-10%	80-10%	.2075
Montreal	40-5%bc	40-10-5%bc	18.15h
New Orleans	83%	83%	.2125
New York	85%	85%	.32g
Philadelphia	80%	82%	.2025
Pittsburgh	82%	82%	.175
St. Louis	70-10%c	70-10%c	.2075
San Francisco	66%c	73%c	.2075
Seattle	52%c	53%c	.21

Price of 100% Ammonia Gelatin is $0.0125 per lb. higher than 40%

Glass: a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $47.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. b Discount from list, Sept. 1939; sales tax included, but 6% tax exemption not allowable for. c Single thickness. e Discount from list of Jan. 16, 1946. f ss, ds 60%.

Explosives: * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $9.00 per trip. h F.o.b. city per 100 lb. forcite, 40%. Forcite 60%, $19.90. i F.o.b. Beloeil (near Montreal).

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C. L. 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.155	$0.1825	$0.2025
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.16 - .1675	.1875-.20	.2075-.22
Rocky Mtn. States	.16 - .1725	.1875-.20	.2075-.225
Pacific N. W. States	.1575-.17	.19 - .2025	.21 - .2225
Pacific S. W. States	.155 - .1625	.1875-.195	.2075-.2175

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	 Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.43	
12-in. 2-ft. from butt	6-in.	50 to 59-ft.	.46	
12-in. 2-ft. from butt	6-in.	60 to 69-ft.	.50	
12-in. 2-ft. from butt	6-in.	90 to 100-ft.		.79
13-in. 3-ft. from butt	5-in.	91 to 100-ft.		.80
14-in. 2-ft. from butt	6-in.	50 to 69-ft.	.50	.87
14-in. 2-ft. from butt	6-in.	70 to 79-ft.	.54	.81
14-in. 2-ft. from butt	5-in.	80 to 85-ft.	.67	.82
14-in. 2-ft. from butt	5-in.	85 to 89-ft.		.83
14-in. 2-ft. from butt	5-in.	90 to 100-ft.		.87

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b., per tie for carload lots:		6"x8"x8' Untr.	 Tr.	7"x9"x8'6" Untr.	 Tr.
Boston	Oak	i			
	Pine	i			
New York	S. L. Sap Pine	$1.65	$3.00	$2.25	$3.40
	Mixed Oak	2.00	3.20	2.50	3.70
Birmingham	Hardwood	1.00	1.60c		2.25a
Chicago	Red Oak		2.50-2.60		3.25-3.45a
Los Angeles	Douglas Fir				
	Redwood				
Philadelphia	Red Oak	2.15-2.33	3.10-3.13a	3.00-3.10	4.15-4.25a
St. Louis	White Oak	2.50		3.25	
	Red Oak	2.45	3.15a	3.20	4.10a
	Sap Pine or Cypress	3.00c		3.85	
San Francisco	Douglas Fir	1.28e	2.24ef	1.70ef	3.05ef
Montreal	Birch or Maple	h	h	h	h

Tr.—Treated; Untr.—Untreated. a Creosoted. b 7" x 9" x 8'. c Empty cell. e Green. f F.o.b. cars. h No constant price available. i Not available.

CHEMICALS

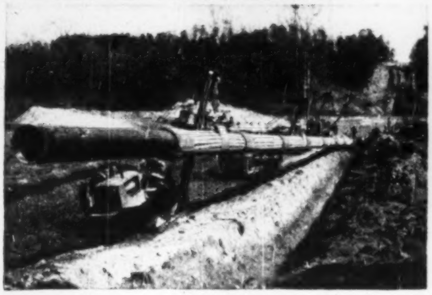
Water, sewage treatment, road work, f.o.b. carlots, New York

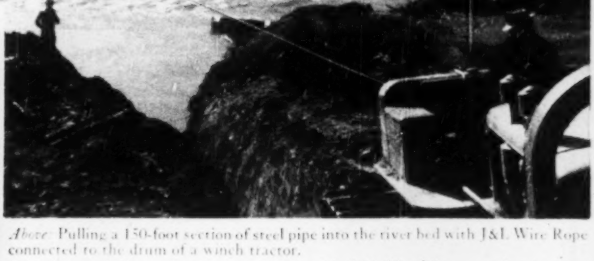
Bleaching powder in drums f.o.b. works, per 100 lb.	$4.50
Chlorine cylinders, liquid, per lb. f.o.b. works	.08-.12
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	22.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	1.80
Soda ash, 58%, in paper bags, per 100 lb., dense	1.35
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.50
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	8.10

(Continued on page 69)

TOUGH "TALLAPOOSA CROSSING"
called for
TOUGH J&L WIRE ROPE

J&L STEEL





Above: Pulling a 150-foot section of steel pipe into the river bed with J&L Wire Rope connected to the drum of a winch tractor.

Left: Four side-boom tractors, equipped with J&L Wire Rope, guide the pipe into the river.

Midwestern Constructors, Inc., lays gas pipe lines . . . uses J & L Wire Rope in vital operations

Midwestern Constructors, Inc., had a tough problem in laying a 30-inch gas pipe line through the solid granite bed of the Tallapoosa River, near Wadley, Ala. But with the help of J&L Wire Rope, another link was completed in the 2,250-mile pipe line which eventually will supply New York City with 500,000,000 cubic feet of gas daily from Texas fields.

Here was the situation: A steep slope . . . swollen waters and swift currents . . . solid granite river bed! But in six weeks the job was finished despite adverse conditions, including cold and rainy weather.

Wire ropes were strung across the river to anchor equipment against swift currents. A trench five feet deep and 318 feet long was blasted in the river bed. Tow "cats," side boom "cats," a backhoe, and a clamshell went to work cleaning out shattered rock and moving the pipeline into position—all equipped with J&L *Precisionbilt* Wire Rope.

Like many other large contractors, Midwestern Constructors, Inc., of Tulsa, Okla., has standardized on J&L Wire Rope for all its heavy-duty equipment. And for good reason. They have found that J&L Wire Rope lasts longer on tough jobs, raises the safety factor and reduces down-time resulting from wire rope replacements.

J&L Wire Rope is Precisionbilt with quality-controlled steel. Wires, drawn with uniform precision, are fitted together accurately to provide longest possible wear.

Our handbook, "Wire Rope Is a Machine," tells how to operate and maintain wire rope for maximum service. It is written *for the man on the job.* If you use wire rope, you'll want a copy. Return the coupon today!

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Please send me a free copy of your new handbook, "Wire Rope Is a Machine."

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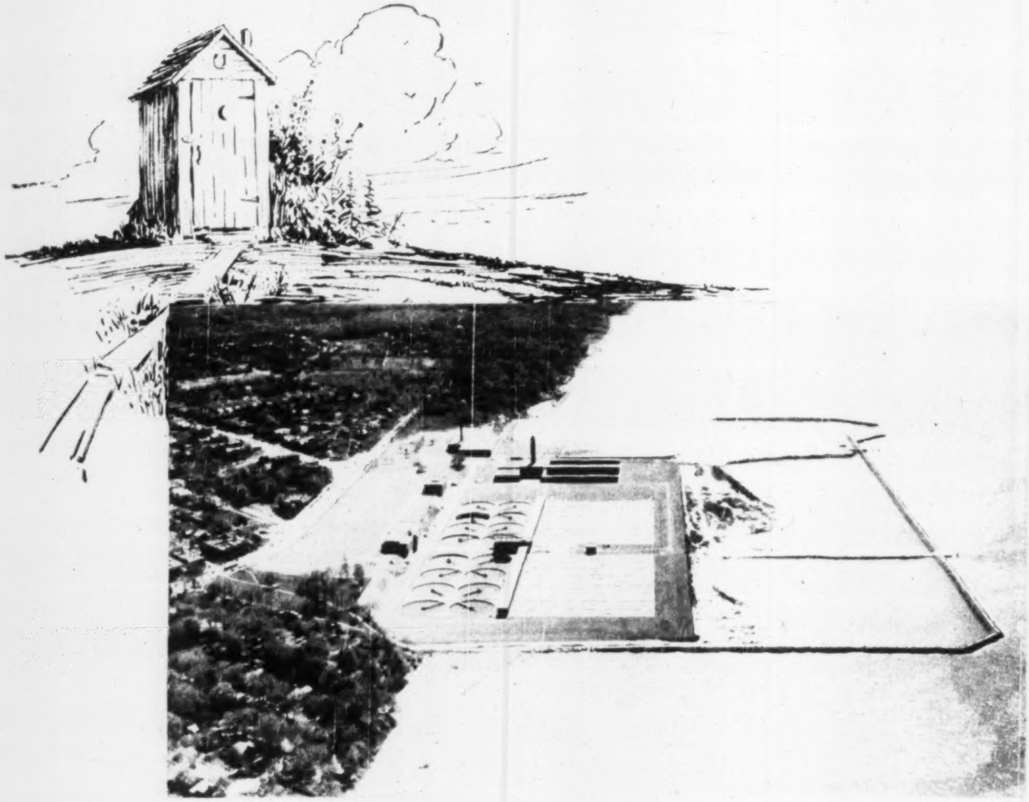
JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS



NOW MODERN Disposal Plants *WITH*
ROTOVALVES *IN SERVICE*

LEADING in design and construction to meet peoples' needs, prominent engineers have turned, in ever-increasing numbers, to Rotovalves by Smith. For here is a cone valve in which the plug lifts, rotates and seats itself; which provides minimum loss, and gives positive, quick action. Obtainable in a complete line of sizes, with either manual, hydraulic or motor control, for *stop* and *check service* for Sewage and general Sanitation needs. *Shipment from stock.* Send for full data pertaining to your *own* problem!

S. MORGAN SMITH Co.
YORK, PENNA. U.S.A.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION SCORED Per M. lots of 2,000 pieces or over. 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING SCORED Per M. lots of 2,000 pieces or over. 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton. In paper. Carload lot. Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	......	......	......	......	......	......	$25.00	$25.00	$19.00	$17.50	$17.50
Baltimore	$175.00	$185.00	$325.00	$380.00	......	......	34.00k	40.00k	26.00	20.00	......
Birmingham	97.50	104.00	195.00	231.00	......	......	20.00f	22.50g	24.74	16.30	......
Boston	142.00†	151.00†	284.00†	322.00†	......	......	32.00i	35.00i	30.80†	26.40†	......
Chicago	115.00	122.50	230.00	......	......	......	21.00	23.00	28.50	23.00	......
Cincinnati	171.00j	190.00j	350.00jdd	278.00j	$355.00	$405.00	34.50j	44.00j	24.25j	24.25j	24.25
Cleveland	118.00e	126.00ee	236.00ee	......	......	......	30.00	30.00	25.50	23.50	29.90ee
Dallas	......	110.00	......	......	......	......	18.75	33.25	31.90	21.80	
Denver	......	......	......	......	......	......	32.00	38.00	34.80bb	28.00bb	34.00bb
Detroit	*116.65	124.40	233.25	......	$289.65	$331.00	33.50ee	32.00ee	28.00	26.50	
Kansas City	115.50	122.50	245.00	245.00	303.50	367.00	25.00o	37.50o	28.50p	22.50p	25.00p
Los Angeles	r	r	r	r	r	r	20.00§		36.00	36.00	32.00
Minneapolis	158.00p	176.00p	330.00p	176.00ep			31.25ep	35.25	35.00bbe	26.00bbe	35.00bbde
Montreal	115.00kq	125.00kq	255.00kq				25.50	35.50	22.40u		
New Orleans	160.00	160.00	300.00				29.00		38.00	26.00	37.50
New York	118.20h	126.00h	173.30kh	189.50hn			33.00		34.40	26.80	
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	29.00	32.00	31.00	19.50	24.50
Pittsburgh	112.00	117.00	189.00	216.30	279.40	317.80	28.00	38.00y	24.00	22.00	2.97m
St. Louis	120.00	135.00	180.00	252.00	339.00		34.50d	32.50d	.80aap	.60aap	1.00aaper
San Francisco	132.00i	148.50i	198.00dda	148.50a			33.00		25.30	25.30	2.49m
Seattle	150.00ee	160.00e		160.00eee			32.00s	39.00s	34.00hh	34.00hh	3.60mhh

† F.o.b. yard Roxbury. a Smooth. b Per 50 lb. bags. c 6 x 12 12 in.-3 cell. d Pulverized hot. e 5%, 10th following month. g 5¼ x 8 x 12. h F.o.b. trucks, job site N.Y.C. i F.o.b. warehouse only. j Truck load or over. k $1.00 discount. l Red face. m Per bbl., 180 lb. n 7¾ x 7¾ x 12. Speed tile. o F.o.b. Buffalo. p Truck lots. q Provincial and Municipal tax extra. r Not used because of earthquake danger. s 2% discount for cash. t 5¼ x 8 x 11½. u Tax exempt. v Sand lime. w 5 x 8 x 12. y Stacked. z Pebble lime price per 80 lb. sack. aa Price per sack. Lime not sold per ton. bb LCL. cc Truck delivery. dd 6 x 12 x 12. ee Pebble lime. ff 80%, common. gg Select. hh LCL. § F.o.b. plant. * All load-bearing, non-load-bearing no longer mf'd in Detroit.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases in oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 300 lb. bbl. per ton
Atlanta	$16.00	$26.375	$1.75	$2.70	$1.65	$2.06‡	$2.06‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	15.75	26.00	2.25	4.10	2.90	2.98	3.96	3.96	.55	39.00
Birmingham	16.00	26.375	3.90	3.40	....	2.80	2.75	2.75		40.50o
Boston	15.75	26.00	....	....	....	2.68h	2.41	2.67‡q	.36	40.00
Chicago	15.75	26.00	....		....	2.34‡o	2.54‡o	2.54‡o	34.00‡bbe	37.00‡
Cincinnati	15.75	26.00	2.90	2.90	....	2.092‡	2.178‡o		.2743q‡	
Cleveland	15.75	26.00	2.50gg	2.75gg	2.35	2.20	2.29o	2.29o	.30j	33.00
Dallas	16.00	26.75		4.05	....	3.50q	3.75o	4.35o	.36	46.00
Denver	16.25	26.50	2.63	4.38	2.48	3.20o	2.20o	2.20o	.41f	40.00
Detroit	15.75	26.00	2.35	3.30	2.50	2.09	2.18f	2.18	.51	35.00
Kansas City	15.75	26.12		2.46	....	2.09	3.63	3.63	.283	43.20
Los Angeles	15.75	26.25	2.80	3.75	3.50	2.36	1.57e	l	.37	l
Minneapolis	15.75	26.12–28.55				2.09vdd	2.18vdd	2.18vdd	.336vdd	35.00
Montreal		22.00	3.75t	4.20t	3.62t	3.25t	3.00tj	3.00tj	.79t	2.60kt
New York	15.75	26.00	3.45y		....	2.32	2.41o	2.41o	.34z	35.00
Philadelphia	15.75	26.00	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	15.75	26.00	2.20	2.20	2.00	2.75	2.75o	2.75o	.37	39.00
St. Louis	15.75	26.00				2.71	2.82h	2.82h	.41	36.00
San Francisco	15.75	26.25	1.80	2.75n	1.25	2.27	3.30ca		.38	..
Seattle	15.75	26.50	2.51m	2.67m		3.26mqcc	2.78hmcc	..	.59mcc	48.75mc

‡ Delivered. Note: Red lead in oil 50¢ higher than white lead in oil. a Red lead prices change frequently due to pig lead price changes. b U. S. War Dept. Spec. 3-49A. c ASTM Spec. D266-31. d 80%, minimum ferric oxide. e 15 lb. f Per 432 sq. ft. h Per roll 65 lb. i Net carload lot prices; Minneapolis and Vicinity. j Asphalt pitch. k Per cwt. l Not used. m 1% discount for cash. n May, 1941 price. o Per 60-lb. p 6-drum. q Per 90-lb. roll. r F.o.b. factory Chicago. s ASTM Spec. D266-41. t Federal tax included. u Per 90 lb. square. † Per ton. w Price to large paint contractors is $1.25 less. x Mineral surfaced. y 55-gallon container. z Drums. aa Approximate cost per 100 lbs. bb Roofers coating and cement. Price per ton. cc LCL, truck delivery. dd 2% cash discount. ee Asphalt, in 100-lb. package. ff 5-gal. drums. gg F.o.b. factory.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Brick-layers	Car-penters	Struct. Iron Workers	Hoisting Engineers	Plas-terers	Electrical Workers	Steam-fitters	Common Labor Building	Heavy Const.
Atlanta	$2.50	$1.85	$2.25	$2.125	$2.375	$2.25	$2.00	$1.00	$1.05
Baltimore	3.00	2.35	2.65	2.50–2.80	2.50	2.40	2.40	1.35	1.35
Birmingham	2.50	1.90	2.20	1.875	2.20	2.25	2.25	1.00	1.10
Boston	2.775	2.25	2.55	2.60	2.70	2.60	2.45	1.75	1.75
Chicago	2.825c	2.55m	2.60	2.50	2.55	2.65	2.45	1.90m	1.90m
Cincinnati	2.70	2.25	2.425	1.675–2.675	2.50	2.55	2.35	1.65	1.65
Cleveland	2.70	2.70	2.70	2.70	2.70	2.70	2.70	1.975	1.85
Dallas	2.50	2.125	2.25	2.25	2.50	2.375	2.375	1.075	1.275–1.50
Denver	2.00	2.35	2.20	2.30	2.50	2.50	2.40	1.45	1.45
Detroit	2.75	2.50	2.70	2.70	2.80	2.75	2.625	1.80	1.80
Kansas City	2.65	2.20	2.35	2.425	2.80	2.475	2.55	1.625	1.625
Los Angeles	2.75	2.20	2.58	2.15	3.125	2.50	2.50	1.65	1.65
Minneapolis	2.40	2.12	2.275	2.67	2.50	2.41k	2.32	1.52	1.52
New Orleans	2.60*	1.975	2.35	2.225	2.275	2.40	2.35	1.10	1.10
New York	3.20b	3.005	3.25	3.25	3.50a	3.00a	2.75c	1.90	1.90
Philadelphia	3.31i	2.525	2.89j	2.50	3.075c	2.875–3.125	2.825l	1.475	1.775
Pittsburgh	3.00	2.65	2.625	2.80	2.625	2.625	2.80	1.60	1.60
St. Louis	3.09e	2.505	2.50	2.55	2.75	2.6775e	2.625	1.65	1.60–1.75
San Francisco	3.00a	2.375	2.50	2.15	3.00	2.625	2.50	1.55	1.55
Seattle	3.00	2.195	2.395	2.43	3.00	2.50	2.50	1.795	1.83
Montreal*	1.60	1.40	1.50	1.30	1.50	1.50	1.55	1.08	.85

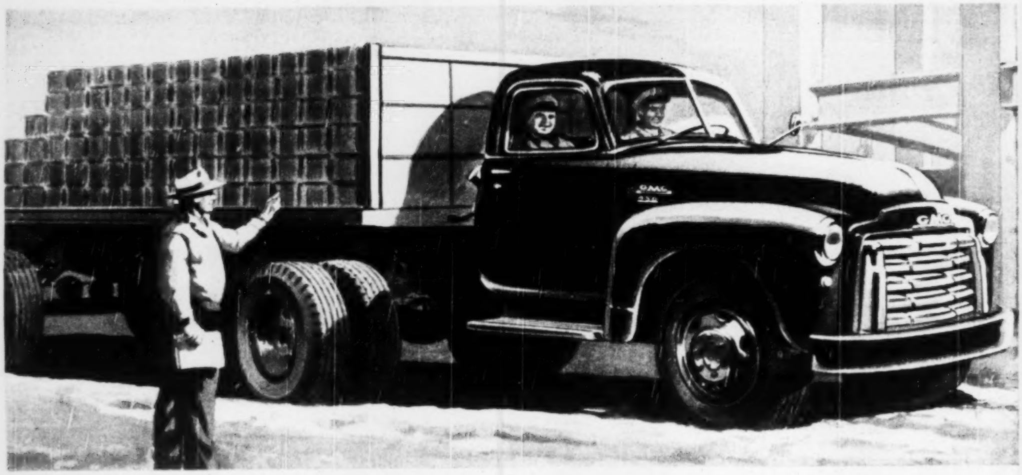
a 6 hr. day. b 7 hr. day. c Incl. 3% vacation stamp fund for bricklayers, 2% for electricians. * Cost of living bonus now included in base wage. e Includes 5c per hr. tool replacement. † Plus $5.00 daily bonus. g $2.20 bonus and housing + 5c vacation fund. i Incl. 2% welfare. j Incl. 9c hr. welfare. k Incl. 7½c hr. welfare fund. l Incl. 4% vacation fund. m Incl. 5c hr. welfare ins. fund. n Incl. 6c hr. welfare fund.

MEXICO CITY PRICES

In Pesos, F.o.b. City		June '50	July '50
Common Wages—Building (8 hr. day)	av. per hr.	.53	.53
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.69	.69
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	1.88	1.88
Bricklayers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Steel Shapes 3"–15" x 12 meters	per ton	925.25	925.25
Reinf. Steel, Corr. Rods			
¼" x 11 meters	per ton	1,010.00	1,010.00
⅜" x 11 meters	per ton	1,000.00	1,000.00
½" x 11 meters	per ton	990.00	990.00
⅝" x 11 meters	per ton	980.00	980.00
¾" x 11 meters	per ton	980.00	980.00
1" x 11 meters	per ton	980.00	980.00
Gravel, truck load of 3½ cu. meters			
Blue Gravel	per tr. load	34.00	34.00
Rose Gravel	per tr. load	30.00	34.00
Cement, Std. Port. (Tolteca)	per ton	120.00	120.00
Lumber			
Mex. Sacred Fir (Oyamel)	per M ft.	600.00	600.00
1st Class Pine	per M ft.	850.00	880.00
2nd Class Pine	per M ft.	750.00	750.00

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers) $2.544. **ENR Common Average:** $1.561.

SLING YOUR LOAD ON A GMC-*and watch it roll!*

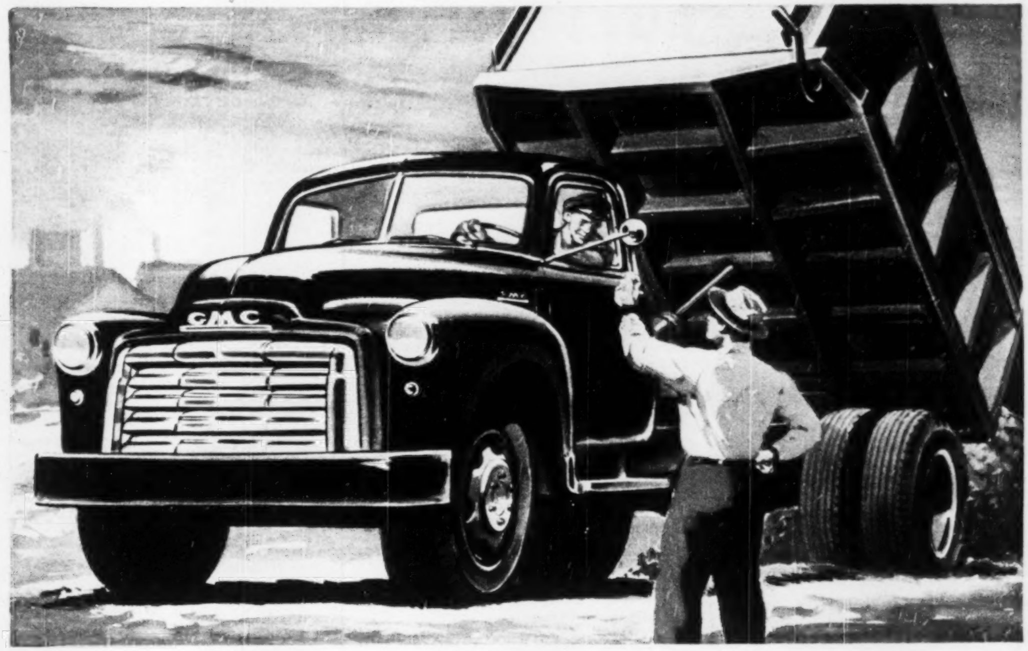


These Middleweight Movers Can Take Most Anything

RIG the short wheelbase with dump body, cement mixer, or fifth wheel for trailer work—or take a longer job with stake or flat body for moving what comes. Mister, you'll *never* find the like of these GMC 450-470 Series for getting your hauling done!

These babies are burly all the way through. Just check on the gear ratios you can get—five-speed direct or over-drive transmissions plus a choice of hypoid, two-speed or double-reduction rear axles. That's why the same truck you see slogging a full load up a tough climb can beat up such a breeze on the highway.

Or put this truck on the hoist and see how it's built underneath—heavy duty in every



detail. Don't miss those alligator crossmembers that put rigid strength in the frame with less dead weight. GMC's don't need fishplating to support a body. Note that the spring hangers lap around and *under* the frame – loads don't ride the rivets in GMC's. There's added safety, also, in having the *two* top leaves in the front spring wrap around the shackle bolt.

GMC

GASOLINE & DIESEL TRUCKS

FROM ½ TO 20 TONS

GM
GENERAL MOTORS

Your key to greater hauling profits

Get Behind The Wheel For The Real Story

Drivers would rather wheel a GMC than anything else on the road. No other truck can steer as easy as these jobs with the GMC recirculating ball-bearing gear – and the wide-tread front end boosts road stability. The 120-HP valve-in-head "workhorse" engine, constant-mesh transmission, and cushion-disc clutch – these make a power team that any guy is glad to have on his side. And the GMC lifetime "six-footer" cab has room to spare for the biggest Joe in the outfit.

GMC Series 450-470 comes in wheelbase from 122 to 197 inches, and ranges from 19,000 lbs. GVW to 37,000 lbs. GCW. Let your GMC truck dealer show you full details and full specifications on the truck that's best for your own job. Then, when you read the price tag – you'll see why these GMC's are *far and ahead the best buy in the middle-duty class.*

GMC Truck & Coach Division of General Motors

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

Tex., Dallas—B.A. 8/15—City, City Hall, elevated steel water tower and tank, Contr. 356. Approx. $50,000. J. T. Conroy, Dallas, P. wks. engr. 7/21/49.

Fla., Jacksonville—B. A. 8/17—City, City Hall, two ground storage reservoirs, aerator, pumping station and incidental facilities. Plans deposit $5. Reynolds, Smith & Hills, 227 Park St., Zone 1, engrs. CD 5/17/46.

LOW BIDDERS

▲ **Tex., Dallas**—City, City Hall, July 25, addnl. work on Carrollton Water Plant, etc., from W. G. Cullum & Co., Grant National Life Bldg., and Whitte Constr. Co., 3102 Kings Row, **$2,563,509**. Est. $2,220,000; and c.i. water mains, in Preston Hollow area, from H. J. Happel Co., 501 E. Admiral St., Tulsa, Okla., **$32,116**. CD 6/30.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Tex., Longview—B.A. 8/21—City, Longview, outfall main and sewage disposal plant. $75,000. Plans deposit $50. G. O. Summers, c/o owner, engr. CD 6/9/48.

Calif., Carmel—B.A. 8/28—Carmel Sanitary Dist., Ocean & Dolores Sts., sewers and appurtenances. Approx. $50,000. Plans deposit $5. Clyde C. Kennedy, 604 Mission St., San Francisco, engr.

CONTRACTS AWARDED

▲ **O., Cleveland**—City, City Hall, digestion tank and 6 concentrating tanks, 6 tank covers, to Hunkin-Conkey Constr. Co., 1740 E. 12 St., Cleveland, **$1,987,350**. Est. $2,250,000. Bids 7/7, awarded 7/19. CD 7/17, under LB.

BRIDGES

LOW BIDDERS

▲ **New Jersey**—New Jersey Turnpike Auth., War Memorial Bldg., Trenton, July 28, Contr. 57, constr. 4 steel, rein.-con., bridges and 2 rein.-con. multiple arch culvert type bridges, together with incidental grading, drainage and paving in connection with constr. of Sec. 3, between Moorestown and Allentown, Burlington and Mercer Counties, from George M. Brewster & Son Inc., 275 W. Fort Lee Rd., Bogota, **$1,380,469**. CD 7/19.

Pennsylvania—State Hy. Dpt., Harrisburg, July 28, constr. I-beam bridge divided hy. consisting two 22 ft. variable width lanes of c. conc. pavement on each side of a concrete divider, divided hy. consisting two 24 ft. width lanes of plain c. conc. base with bit. surf. on each side of a concrete divider, widen pavement with plain c. conc. base with bit. surf. 27 ft. wide crushed aggregate base with bit. surf. 48 ft. and variable in width and c. conc. pavement for paving railroad crossing 6,812 ft. L. R. 91 (15 B) T. R. 8, over French Creek, Franklin Venango Co., from Ferguson & Edmondson Co., Keystone Bldg., Pittsburgh, 22, **$956,727**. CD 7/12.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, substructure for bridge and embankments over American River near [illegible] about 3 mile n. e. of Sacramento, Sacramento Co., to Lord & Bishop, Box 312, Sacramento, **$608,569**. Bids 7/19. CD 7/25, under LB.

STREETS AND ROADS

BIDS ASKED

† **California**—B. A. 8/22—U. S. [illegible] Weight Bldg., Sacramento, streets, sewers, flood [illegible] Housing Area, [illegible] 1999, Kern Co.

Tex., Houston—Bids Asked—Prokop [illegible] Co., [illegible] street, [illegible] Westcrest subdivision. [illegible] 3948 Main St., engr.

LOW BIDDERS

† **Colorado**—Bureau of Public Rds., Dpt. Commerce, 555 New Customhouse, Denver, July 26, [illegible] Forest Hy. Proj. 32 B1, [illegible] from Peter Kiewit Sons' Co., [illegible] Ave., Denver, **$121,700**; [illegible] Proj. 33 A, [illegible] from Northwestern Eng. Co., [illegible] Denver, **$149,975**. CD 7/[illegible]

Delaware—State Hy. Dpt., Dover, July 27, 20 ft. stabilized and surf. tr. road 9124 mi. Susan Beach's Corner to Portsville, Fed. Aid Proj. S-98 (1), Contr. 1067, Sussex Co., from George & Lynch, Delaware Trust Bldg., Wilmington, **$159,499**. CD 7/7.

Maryland—State Rds. Comm., Baltimore, July 25, sandstone base course, surf. 1.191 mi., section Mill Run Rd., beginning at Old Westerport-Lonaconing Rd. at George's Creek, exten. northwesterly toward Garret Co. line, Contr. A-382-1-617, Allegany Co., from Geo. F. Hazelwood Co., Inc., Cumberland, **$73,511**. CD 7/13.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., Boston, July 18, hy. and bridge at Grove Station St., F 9103 (2), Adams, from Henley-Lundgren Co., 193 Hartford Pike, Shrewsbury, **$418,692**. P. H. Kittfield, 100 Nashua St., ch. engr. CD 7/11.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., Boston, July 18, hy. work on Blue Hill Ave., Boston, from San-Vel Contr. Co., Ayer Rd., Littleton, **$138,289**; hy. work, Grove St. to Neponset St., Worcester, from Sacco Constr. Co., P. O. Box 1166, Woonsocket, R. I., **$172,173**. CD 7/14.

New York—Bureau Contracts & Accounts, Albany, July 26, b. conc. Type 1 A, opt. 1 mi. Mayfield Village, S. H. 5194, Mayfield-Northville, Pt. 1, S. H. 363, Contr. No. RC 50-34, Fulton Co., from Kenn Constr. Corp., Nort Tonawanda, **$102,308**. est. $122,000. *** received no bids July 26, b. conc. Type 1 A opt. 0.48 mi., misc. work 0.2 mi. Amityville Village, Broadway, S. H. 1633, Amityville Village 5300, Contr. No. RC 50-35, Suffolk Co. est. $132,000. CD 7/14.

▲ **Pennsylvania**—State Hy. Dpt., Harrisburg, July 28, constr. divided hy. incl. c. conc. pavement 22 ft. wide on each side of earth divisor area 20 ft. and variable in width and incl. 6 rein.-con. structures, c. conc. variable 30 ft. to 19 ft. in width all on Route 119, Sect. 11; divided hy. consisting of c. conc. 22 ft. wide on each side of an earth divisor area 20 ft. and variable in width and incl. 3 rein.-con. structures and one rein.-con. bridge; constr. consisting replacement or widn. existing pavement with c. conc. 11 ft. width and crushed aggregate base with bit. 33 ft. to 2 ft. in width, variable width earth and conc. division area and exten. rein.-con. structures, 11 on Route 119, Sects. 11 and 124; Schedule 3, proj. as whole 28,498 ft. from point in Greensburg City east to point beyond intersection of L.R. 119 and 64040, Greensburg City, Hemfield and Unity Twps., Westmoreland Co., from C. J. Langenfelder & Son, Inc., P. O. Box 5106, Baltimore, Md., **$2,449,711**.

bit. resurf. 22 ft. in width incl. 3 exten. structures, widn. pavement with granulate slag base 11 ft. left and right and 38 ft. in width crushed aggregate base with bit. 22 ft. in width incl. constr. rein.-con. arch exten. 3 bridges 39,916 ft. LR 15 (S-54) T.R. 18 westerly to Smith Twp., Burgettstown Boro line, Mt. Pleasant and Smith Twps., Washington Co., from Charles Ballzick, Jefferson, **$428,398*****c. conc. 33 ft. in width, incl. constr. 5 rein.-con. structures, rein.-con. bridge 25,500 ft. L.R. 229 (2B) T.R. U.S. 11-15 from McKees Half Falls to point north of Port Trevorton, Union and Chapman Twps., Snyder Co., from Malvin Schaller & Edward A. Hoffmeister t/a Schaller and Hoffmeister, Fairmont, Schuylkill Haven, **$1,176,305**

divided hy. incl. c. conc. 22 ft. and variable in width on each side of conc. divisor incl. 2 plate girder bridges and 2 rein.-con. structures, crushed aggregate base with bit. 18, 20 and 22 ft. in width c. conc. 48 ft. and variable in width; constr. 2 rein.-con. bridges and c. conc. for paving railroad crossing also 3,902 lin. ft. grading for railroad relocation, 17,141 ft. L.R. 185 (5), 53041 (1), 53045 (1), 53092 (2) T. R. 29 for the McAdoo Boro, Kline Twp. line South Rush and Kline Twps., Schuylkill Co., from S. J. Groves & Sons Co., P. O. Box 63, Downingtown, **$2,525,321*****c. conc. 33 ft. and variable in width and incl. 7 rein.-con. structures 29,999 ft. L. 195 (6A) T.R. US 11-15 from Amity Hall to point south of Half Falls, Watts Twp., New Buffalo Boro, Perry Co., from Nello L. Teer Co., Durham, N. C., **$1,248,541*****c. conc. 22 ft. in width and constr. I-beam bridge 3,023 ft. long L.R. 63 (R-5A) T.R. 119 in Punxsutawney Boro, Young Twp., Jefferson Co., from B. B. Constr. Co. Philipsburg, **$186,349**. CD 7/11.

Pa., Phila.—Dpt. Pub. Wks., City Hall Annex, paving Schedule I and Schedule H from Union Paving Co., 1227 N. Broad St. **$124,972** and **$119,994** respectively***Schedule E-1 from Frank Mark Co., Castor Ave. and Wingohocking St. $59,518***Schedule B-8, B-12 from Harry C. Erb, Inc., 1505 Race St. **$61,798*****Schedule B-9, D, from James D. Morrissey, Inc., 9119 Frankford Ave. **$55,965*****Schedules B-6, B-10, B-11 from Asphalt Paving Supply Co., Norristown, **$72,450*****Schedules E-3 and B-13 from General Asphalt Paving Co., 6851 Rising Sun Ave., **$101,370** and **$80,461** respectively. A. Zane Hoffman, c/o owner, ch. engr. CD 1/31/45.

Tex., Dallas—City, City Hall, July 25, grading, surf. Harris Court, T & P Ry., Schill-Caldwells Sts., etc., from Dallas Foundation Co., 3113 Elm St. **$74,826**. CD 5/24.

Virginia—State Hy. Comm., Richmond, rejected bids July 18, hard surf. 3.62 mi., Secondary Route 743 from U. S. Route 58 west of Volney to North Carolina line, Grayson Co., L. B. **$54,415**; hard surf. 1.66 mi., Secondary Route 735 between Buffalo Springs and White House, Mecklenburg Co.; hard surf. 1.33 mi., Secondary Routes 679 and 615 from Glade close south to Route 616, Smyth Co. CD 7/21 under LB and CD 7/5.

Wisconsin—State Hy. Comm., Madison, July 25, base course 6.277 mi. The Forward U. S. H. 18 Road, Proj. S 0254 (1), C. T. Hy. G, Contr. 1, from P. W. Ryan Sons, Janesville, **$219,034*****grading draining 4.41 mi. The Monroe-Monticello Rd., S. T. Hy. 69, Proj. T 032-1 (2), Contr. 1, Green Co., from S. J. Groves & Sons Co., 510 Wesley Temple Bldg., Minneapolis, Minn., **$167,395*****c. conc. 1.594 mi. Oconomowoc-Waukesha Rd., U. S. Hy. 16, Proj. F 06-1(21), Contr. 1, from James Cape & Sons Co., Racine, $84,174***c. conc. masonry resurf. 0.44 mi. Blackhawk Ave. (City of Prairie du Chien), U. S. Hy. 18, Proj. T 017-1 (2), Crawford Co., from Universal Eng. Co., Medford, **$59,333*****grav. or crushed stone 11.793 mi. Danbury East County Line and West County Line-Minong Rds., S. T. Hy. 77, Proj. T 0259 (1) and T 0259 (2), Contr. 2, ballast, base grav. 9.421 mi. The South County Line—Ingram Rd., S. T. Hy. 73, proj. T 037 (4), Contr. 1, from Dean B. Ekstrom, Superior, **$63,101** and **$98,260** respectively***grav. fill base, surf. course 27.7 mi. The Parkland-East County Line Rd., S. T. Hy. 13 Proj. T 0269 (6), Contr. 1 from Wm. L. Kimmes Inc. and W. L. Kimmes, Superior, **$293,510*****grav. crushed stone base course 10.667 mi. The Platteville-Lancaster Rd., S. T. Hys. 81 and 35, U. S. Hy. 61, Projs. S 0101 (3) and T 08-1 (3), Contr. 3, Grant Co., from Rees Constr. Co., Monroe, **$74,551**. CD 7/7.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, plant mix surf. on cement treated base 3.7 mi, to provide 4-lane divided hy. between Cabrillo Freeway and Fairmount Ave., Exten., San Diego Co., to Griffith Co., 1060 S. Broadway, Los Angeles, **$691,205**. Bids 7/31. CD 7/18, under LB.

Neb., Coleridge—City, Coleridge, paving to Abel Constr. Co., 225 N. 16 St., Lincoln, **$54,840**. Est. $56,700. Henningson Eng. Co., Standard Oil Bldg., Omaha, engrs. Bids 7/21.

▲ **New York**—Bureau Contracts & Accounts, Albany, contract to [illegible] 25 ft. wide concrete arterial 4.25 mi. Southern State Parkway exten. from point near Northern State Parkway southward to Southern State Parkway, incl. grading, drainage, paving 3.64 mi. access roads and construct 4 grade separation struc-

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $23,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar see also preceding issues of ENR.

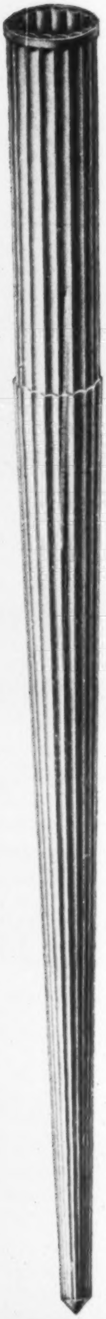
LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported at low bidder stage.

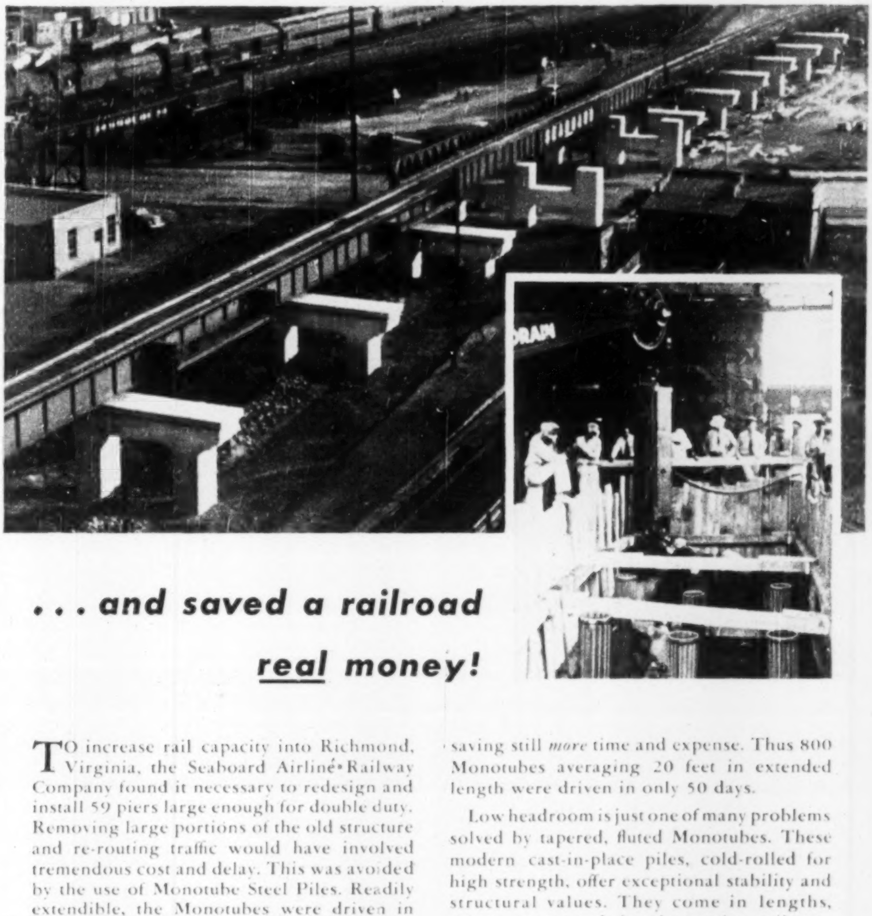
Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over
B A	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily



HOW EXTENDIBLE **MONOTUBE PILES** LICKED LOW HEADROOM



. . . and saved a railroad real money!

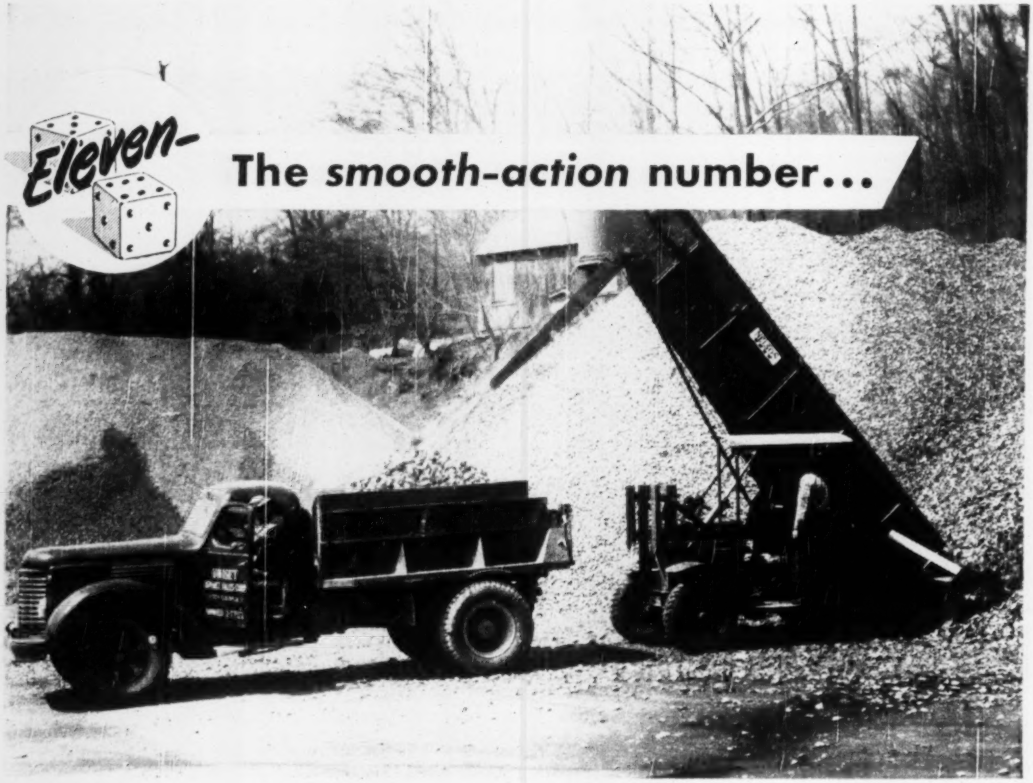
TO increase rail capacity into Richmond, Virginia, the Seaboard Airline Railway Company found it necessary to redesign and install 59 piers large enough for double duty. Removing large portions of the old structure and re-routing traffic would have involved tremendous cost and delay. This was avoided by the use of Monotube Steel Piles. Readily extendible, the Monotubes were driven in 10-foot sections—driven *easily* in the many locations allowing only 20 feet of headroom.

Moreover, because Monotubes are light in weight, and easily driven to required bearing values, there was no need for heavy equipment! A light crane with standard equipment was able to work, with a flat boom, in and around the many obstacles . . . quickly, easily, saving still *more* time and expense. Thus 800 Monotubes averaging 20 feet in extended length were driven in only 50 days.

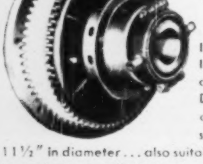
Low headroom is just one of many problems solved by tapered, fluted Monotubes. These modern cast-in-place piles, cold-rolled for high strength, offer exceptional stability and structural values. They come in lengths, gauges, tapers and sizes for varying soil conditions. Jobs started with Monotubes can be *finished* with Monotubes.

But get *all* the facts. Find out how Monotubes can help insure sound construction at minimum cost *whatever* your pile requirements may be. Write to The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL
Monotube Foundation Piles



Nelson P-11 and Q-11 Bucket Loaders Use Twin Disc CL-211 Clutches



Incorporating the latest features in clutch design, Twin Disc CL Clutches are available in sizes from 5½" to 11½" in diameter . . . also suitable for such power transmission installations as couplings for line shafts, drives for pulleys, or with driving spiders carrying gears, sprockets or pulleys. Write for Bulletin 120-C.

In both the rubber-tired and crawler-mounted Nelson Series-"11" Heavy-Duty Bucket Loaders, Twin Disc Model CL-211 heavy-duty clutches are used for *smooth action.* Power is transmitted through an enclosed bevel gear power take-off to Twin Disc Clutches on the elevator and traction drives.

Like most construction equipment, the Nelson Series "11" is built for rugged service—service that requires the most from any friction clutch. No wonder Nelson's engineers rely on Twin Disc's "know-how," based on more than 30 years of experience in the manufacture of heavy-duty equipment for the construction industry.

For more information on Twin Disc Clutches for *your* application, write direct to Twin Disc.

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BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA tures, Suffolk Co., to Zara Contg. Co. Inc., 31 Prospect Ave., Hewlett, $1,581,163; reconstruct with 2 ft. c. conc. pavement 4.89 mi. Route 162 extending southeastward from point approx. 3 mi. southeast of its junction with Route 5-S, to point approx. [illegible] etc., Montgomery Co., to A. [illegible] Decker and Sons [illegible] 3,500 ft. southeast of the hamlet of Rural Grove, Constr. Corp., New Hartford, $530,326.** construct Highbridge Interchange on Cross Bronx Expressway from Amsterdam Ave. eastward for 0.28 mi., incl. 10 span 660 ft. reinf. conc. viaduct, 8 span 400 ft. concrete arch viaduct, two 53 ft. span rigid frame concrete bridges, concrete retaining walls, pedestrian underpass, 0.28 mi. [illegible] conc. paving, etc., New York City Co. 15 Foimer & McCabe Corp., 33 W. 42 St., New York, $3,163,476. Grand total $5,274,985. Bids 6/20. CD 7/26.

Pennsylvania—State Hy. Dpt., Harrisburg, build up and widen 12.22 mi. of existing pavement between St. Marys and Emporium with crushed aggregate base and bit. surf. 22 ft. wide, extend six existing reinf. con. structures over Sanford Run, U. S. 120, St. Marys Boro, Benzinger and Shippen Twps., Elk and Cameron Counties to Donald E. Stabler, 635 Locknow Lane, Harrisburg, $778,908. Bids 7/14. CD 7/18.

Tex., Houston—Garden City Park, Inc., c/o Albert J. Knull, 3434 Arbor St., street constr., asph. paving to J. L. Harrison, Baytown, $67,775. CD 7/21.

EARTHWORK, WATERWAYS

BIDS ASKED

† Louisiana—B.A. 8/15—U. S. Engr. Dept., [illegible] Prytania St., New Orleans, Zone 9, constr. approx. 1,240 lin. ft. standard board revetment, repairing existing bank protection Shreveport and [illegible] area. Serial CIVENG 16-047-51-3.

Pennsylvania—B.A. 8/15—Dpt. Forests & Waters, 465 Education Bldg., Harrisburg, construct flood protection works along [illegible] Creek, Montgomery Co. Plans deposit $4. R. J. [illegible], ch. engr.

† Colorado—B.A. 8/24—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, constr. 1.66 mi. Rattlesnake tunnel, Estes Park [illegible] Spec. 3133. L. N. McClellan, Denver, ch. engr.

† California—B.A. 8/29—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars at shipping point or f.o.b. cars at [illegible], radial gate and radial gate hoist for [illegible] wasteway, Delta-Mendota Canal, Central Valley Proj., Spec. 3134. L. N. McClellan, ch. engr.

† South Dakota—B.A. 8/31—Bureau Reclamation, Dpt. Interior, Hot Springs, construct Angostura Power Plant, Angostura Unit, Missouri River Basin Proj., Cheyenne Div. Spec. 3131. CD 5/25/44.

† Washington—B.A. 9/11—Bureau Reclamation, Dpt. Interior, Coulee Dam, river drainage and repair of spillway face and spillway bucket of Grand Coulee Dam, at Grand Coulee Dam about 90 mi. northwest of [illegible], Spec. 3143. Michael W. Straus, commr. ENR 8/10.

† New York and New Jersey—B.A. About 9/12—U. S. Eng., 90 Lafayette St., New York 13, N. Y., dredging approx. 608,400 cu. yds., place measurement, of all material excl. ledge rock from New York and New Jersey Channels, Sect. A, Areas Nos. 5 and 6, Richmond Co., New York, and Middlesex Co., New Jersey. Serial No. CIVENG 30-075-51-22. CD 10/15/45.

LOW BIDDERS

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., Boston, July 28, furnish and spread sand, Orient Heights Beach, East Boston, from Charles Callahan Co., 35 Stratford St., W. Roxbury, $100,800. P. H. Kitfield, 100 Nashua St., Boston, ch. engr.

† New York—U. S. Eng., 90 Lafayette St., New York, Zone 13, July 26, constructing lock operating machinery and electrical house and other work for electrification of Troy Lock, CIVENG 30-075-50-196, from [illegible], N. Y., $183,510. Est. $197,945. CD 6/19.

CONTRACTS AWARDED

† Louisiana—U. S. Eng., P. O. Box 60, Vicksburg, Miss., earthwork and emergency dam storage, Algiers Lock, Orleans Parish, CIVENG 16-047-50-233, to C. W. Vollmer & Co., Inc., Cotton Exchange Bldg., Houston, Tex., $504,322. Bids 7/20. Awarded 7/26. CD [illegible] 16.

AIRPORTS

BIDS ASKED

Md., Andrews Field—CONTROL TOWER—B.A. 8/17—U. S. Eng., Fort and Duane Sts. N. W., Wash. 25, D. C., 20x100 ft. steel framework, brick, concrete control tower, Andrews Air Force Base. CIVENG 6-43-[illegible]-51-4.

† Fla., Cocoa—TECHNICAL BLDGS—B.A. 8/26—U. S. Eng., 575 Riverside Ave., Jacksonville, Zone 1, constr. 4 technical and 3 utility bldgs. at launching area, Long Range Proving Ground Div. Serial No. Eng 08-123-51-[illegible]. Plans deposit $40. CD 5/24/49.

LOW BIDDERS

N. M., Farmington—AIRPORT—City, City Hall, Farmington, municipal airport, [illegible], Albuquerque, $81,048. Est. $53,400. CD 1/5/49.

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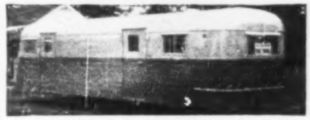

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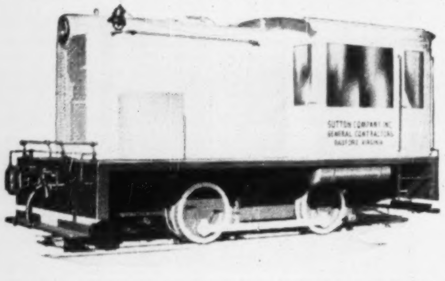

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CONTRACTS AWARDED

▲ **Ill., Alton**—AIRPORT IMPRVS.—Civic Memorial Airport, Alton, grading, drainage, concrete paving north-south runway, and connecting taxiway, concrete extens. parking apron, bit. surf. entrance road and parking area, to Thompson Asphalt Co., Alton, $191,546; sanitary sewage and water supply sys. at airport, to Fleming & Kligo Constr. Co., East Alton, $65,826. Bids 6/30. Awarded 7/27. Foth, Porath & Horner, Green Bay, Wis., engrs.

PUBLIC BUILDINGS

BIDS ASKED

O., Lyndhurst—SCHOOL—B.A. 8/14—Bd. Educ. of S. Euclid and Lyndhurst, Mayfield and Evanston Rds., Lyndhurst, 1 story bsmnt., brick, block, steel elementary school, $400,000. Chas. Bacon Rowley & Assoc., 2008 Keith Bldg., Cleveland, archts. CD 5/10.

▲ **Fla., Orlando**—SCHOOLS—B.A. 9/15—Orange County Bd. P. Instruction, Orlando, North and South Orlando High Schools. Approx. $1,000,000 each. Plans deposit $50 each. James Gamble Rogers II and Francis H. Emerson, Winter Park, archts. CD 5/9/49.

Calif., Sacramento—GARAGE FOUNDATIONS—B.A. 8/15—State Div. Architecture, P. Wks. Bldg., Sacramento, concrete pile foundations for State Garage, Anson Boyd, Sacramento, state archt. CD 10/11/43.

▲ **N. J., Perth Amboy**—HOUSING—B.A. 8/15—Perth Amboy Public Housing Auth., Perth Amboy, 252 unit low rental housing development, Coventry Blvd., $2,500,000. CD 6/27.

N. Y., Brooklyn—HOUSING—B.A. 8/8—New York City Housing Auth., 63 Park Row, New York, Zone 7, heating and ventilating for sect. II, incl. Bldgs. numbered 1 to 3, inclusive, of Farragut Houses (Proj. No. NYS-29), in area bounded by Sands St., Navy, Nassau and Golds Sts. excluding an area at the northeast corner of Gold and Nassau Sts. Plans deposit $75. Extended date. CD 7/14.

O., Avon Lake—SCHOOL—B.A. 8/15—Bd. Educ., Avon Lake, 1 story, brick, steel Lear Road Elementary School, Lear and Division Rds., $325,000. Fulton, Krinsky & Delamotte, archts., and Levi B. Mumma, 6814 Euclid St., Cleveland, engr. CD 4/20.

▲ **Pa., Mayview**—HOSPITAL—B.A. 8/16—General State Auth., 18 and Herr Sts., Harrisburg, female senile patients' bldg., male senile patients' bldg., at Mayview State Hospital, $1,000,000 each. Plans deposit $15 each. Palmgreen, Patterson & Fleming, 429 4 Ave., Pittsburgh, Zone 19, archts. A. F. Jones, c/o owner, ch. engr. CD 11/28/49.

▲ **Pa., Pittsburgh**—GENERAL MEDICAL HOSPITAL—B.A. 8/15—U. S. Eng., 925 New Federal Bldg., Zone 19, 1 story brick, concrete, steel 58x675 ft. general medical hospital, two 46x225 ft. wings, University Dr., $11,000,000. Altenhof & Brown, Ingham & Boyd, Mitchell & Ritchey, York and Sawyer, 230 Oliver Bldg., archts. and engrs. CD 6/6.

▲ **Md., Baltimore**—HOSPITAL BLDG.—B.A. 8/16—City Bureau of Bldg. Constr., 410 Municipal Bldg., Zone 2, 4 story bsmnt., H shape 47x242 ft., 80x130 ft., and 47x242 ft., brick, block, concrete, steel Tuberculosis Bldg. on grounds of City Hospital, Eastern Ave., $2,500,000. Plans deposit $100. Palmer, Fisher, Williams & Nes, 1020 St. Paul St., Zone 2, archts. Van Rensselaer Saxe, 100 W. Monument St., struct. engrs. Egli & Gompf, Inc., 1019 N. Calvert St., mech. engrs. R. E. L. Williams, 410 Municipal Bldg., bldg. constr. engr. CD 1/23.

Md., Baltimore—SCHOOL—B.A. 8/16—City Bureau of Bldg. Constr., 410 Municipal Bldg., Zone 2, 1 and 2 story, bsmnt., brick, block, steel, concrete Northwood Elementary School, North Raven Blvd. and Loch Raven Rd., $[illegible]. Plans deposit $100. [illegible] Mulberry St., Zone 2, archts. [illegible] 135 E. Pleasant St., mech. engr. [illegible] 2017 Maryland Ave., Zone 18, struct. engrs. R. E. L. Williams, 410 Municipal Bldg., bldg. constr. engr. CD 7/16/48.

N. Y., Brentwood—SCHOOL—B.A. 8/16—Bd. Educ., Union Free School Dist. No. 12, Brentwood, general constr., plumbing and heating and ventilating, electrical work for grade school addn. and alterations, $[illegible]. Plans deposit $[illegible]. [illegible]

O., Ravenna—SCHOOL—B.A. 8/16—Bd. Educ., Ravenna, 2 story [illegible] ft. brick, steel elementary school at Maple and Bennett Sts., $290,000. Fulton, Krinsky & Delamotte, 6814 Euclid St., Cleveland, archts. CD [illegible].

Mass., Middleboro—[illegible]—B.A. 8/17—[illegible] Commonwealth of Mass., Dept. Public Health, State House, Boston, [illegible] Lakeville State Sanatorium, over $[illegible]. Plans deposit $[illegible]. [illegible]

Ala., Fort Payne—HOUSING—B.A. 8/18—Fort Payne Housing Auth., [illegible] Ala. 11-1. Plans deposit $[illegible]. CD 6/[illegible]. Extended date.

▲ **Conn., Bridgeport**—HOUSING—B.A. 8/24—City of Bridgeport Housing Auth., [illegible] Lexington Ave., [illegible] State St., [illegible]

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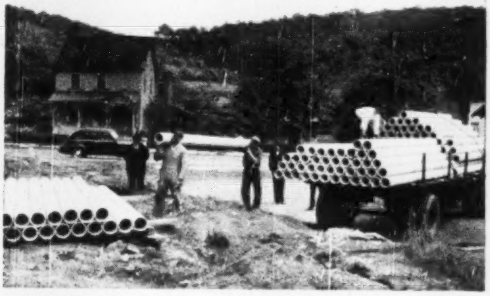

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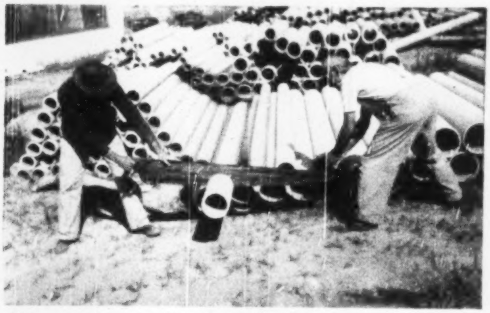

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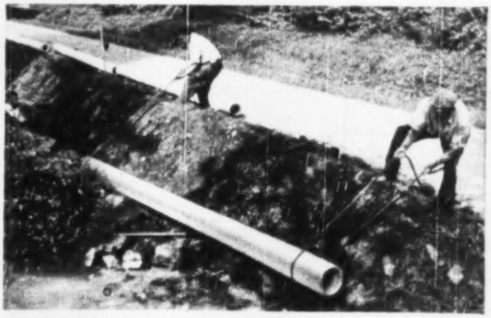

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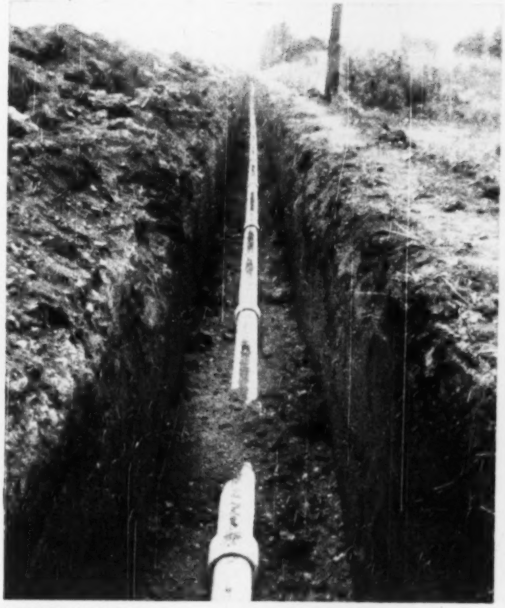

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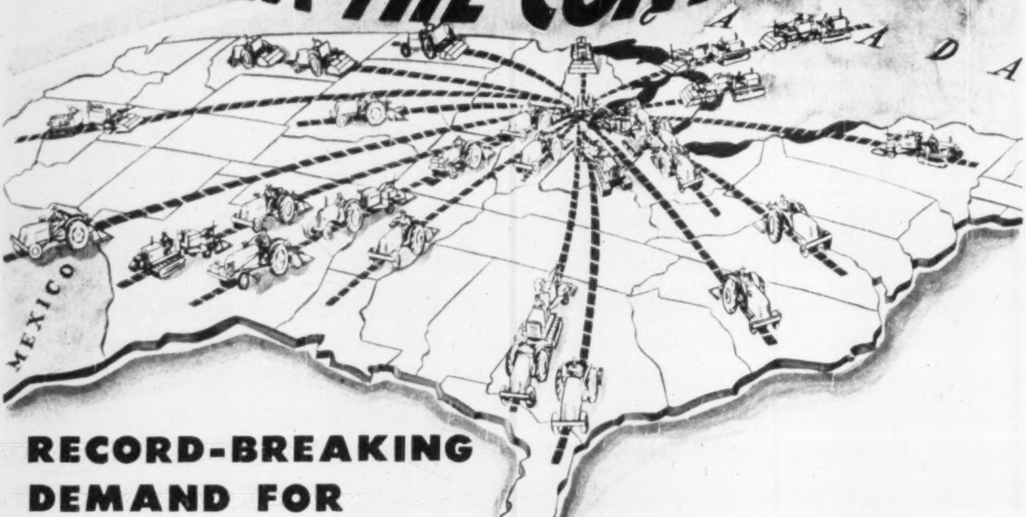

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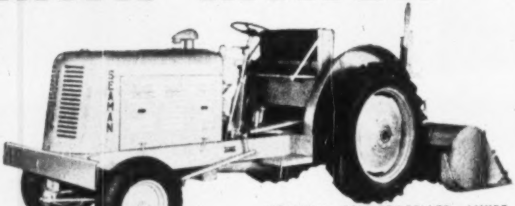

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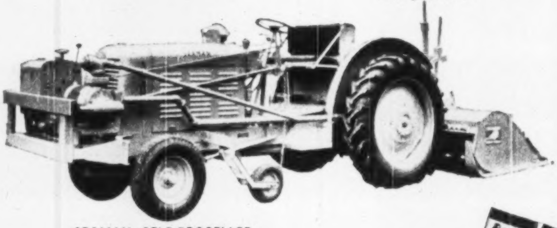

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▲ **Pa., Norristown**—HOSPITAL—B.A. 8/23—General State Auth., 18 and Herr Sts., Harrisburg, general constr.; heating; ventilating; plumbing; electrical; elevators for reconstruction of Bldg. No. 12 for Female Working Patients at Norristown State Hospital. $1,700,000. Plans deposit $15 each. Paul Heron, 1601 Fox Bldg., Philadelphia, archt.; A. F. Jones, c/o owner, ch. engr. CD 9/27.

N. Y. Valley Stream—SCHOOL—B.A. 8/24—Bd. Educ., Union Free School Dist. No. 24, Valley Stream, general constr., plumbing, heating and ventilating, electrical work for Wm. L. Buck grade School, Horton Ave. $725,000. Plans deposit $50 general, $25 each. Frederick P. Wiedersum, 248 Rockaway Ave., archt.

▲ **Tex., Dallas**—HIGH SCHOOL—B.A. [illegible]—Dallas Independent School Dist., c/o Bd. Educ., Akard and Royal Sts., South Oak Cliff High School. $1,[illegible]. Plans deposit $25. Thomas, Jameson & Merrill, 818 N. Harwood St., archts. CD [illegible].

▲ † **N. M., Los Alamos**—UTILITIES—B.A. 8/30—U. S. Atomic Energy Comm., Los Alamos, [illegible] water [illegible] [illegible] underground 13.2KV electrical [illegible] $1,800,000-$2,200,000. Plans deposit $100.

▲ **N. J., Hackensack**—SCHOOL—B.A. [illegible]—Bergen County Vocational School Bd. Educ., [illegible] Admin. Bldg., Courthouse, [illegible] $2,000,000. CD [illegible].

▲ **Pa., Doylestown**—SCHOOL—B.A. 8/31—Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, general constr., heating, plumbing, electrical for [illegible] of secondary school bldg. and [illegible] for [illegible] School Bd., Lower Makefield Twp. $1,[illegible]. Plans deposit $50 each. A. E. Micklewright, 72 [illegible] St., Trenton 9, N. J., archt.; W. W. [illegible], c/o owner, ch. engr.

▲ **Calif., Los Angeles**—SUPERIOR COURTS—B.A. 9/30—Bd. Supervs., Los Angeles Co., 501 Hall of Records, Los Angeles. 12 story steel frame [illegible] [illegible] Approx. $11,[illegible]. Kistner, Curtis & Wright, 816 W. 5 St., archts. CD 8/17/45.

LOW BIDDERS

Calif., East Los Angeles—GYMNASIUM—[illegible] S. San Pedro St., Los Angeles. [illegible] to have been opened Aug. 15, gymnasium bldg. $720,000. CD 7/27.

▲ **Calif., Santa Monica**—COLLEGE BLDGS.—City Bd. Educ., 1333 6 St., July 27, Santa Monica [illegible] College Bldgs. from [illegible] [illegible] Blvd., Los Angeles. $1,319,000. Est. $1,[illegible]. CD 7/7.

▲ **Md., Catonsville-Sykesville**—HOSPITAL—State Dpt. P. Imprvs., 326 Park Ave., Baltimore, July 27, [illegible] story 246x44 ft. brick bldg. for disturbed women, Spring Grove State Hospital, Catonsville and for disturbed men, Springfield State Hospital, Sykesville, from [illegible] & Reynolds, Inc., [illegible] N. W., Washington, D. C., base bid (1) $948,700, (2) $944,080, (3) $944,080, (4) $1,874,700, (5) $2,774,100. CD 7/7.

▲ **Tex., San Antonio**—HOSPITAL—City and Bexar Co., Court House, San Antonio, July 26, [illegible] Robert B. Green Hospital, from [illegible] & [illegible], 928 N. Flores St. $1,294,797. CD [illegible].

CONTRACTS AWARDED

Calif., Los Angeles—SCHOOL—City Bd. Educ., 1425 S. San Pedro St., Los Angeles. [illegible] High School, to [illegible], 4822 W. Jefferson Bl., Los Angeles. $646,700. Est. $[illegible]. Bids 7/14, awarded 7/21. CD 7/24, under LB.

▲ **Calif., Oxnard**—BUILDINGS—Oxnard Union High School Dist., Oxnard, [illegible] High School [illegible] [illegible] Corp., [illegible] Wilshire Blvd., Los Angeles. $1,470,500. Bids 6/22, awarded 7/26. CD 7/7, under LB.

Mass., Cambridge—HOUSING—City Housing Auth., 1418 Massachusetts Ave., [illegible] 3 story [illegible] [illegible] [illegible] [illegible] Pl., [illegible] [illegible] to M. [illegible] & Sons, Inc., 79 Milk St., Boston. $618,000. Awarded 7/21. Bids 7/5. CD 7/14, under LB.

Mass., Lynn—SCHOOL ADDN.—Gen. City, [illegible] High School addn., North [illegible] [illegible] to A. [illegible] & Sons, Inc., [illegible]. $529,900. Awarded 7/19. Bids 7/11. CD 7/24, under LB.

Mass., Newton Centre—SCHOOL—City P. Bldg. Comm., City Hall, 12-classroom Bowen Elementary School, Cypress and Jackson Sts., to [illegible] R. [illegible] & Sons, 21 [illegible] Rd., Brookline. $637,800. Awarded 7/19. Bids 7/5. CD 7/14, under LB.

Minn., Crystal Bay—SCHOOL—Bd. Educ. [illegible], general contract, [illegible] [illegible] Junior-Senior High School, to [illegible] Constr. Co., 700 Builders Exchange Bldg., Minneapolis. $578,948. Bids 7/20. CD 7/26.

▲ **Mont., Galen**—HOSPITAL—[illegible] [illegible] [illegible] [illegible] building, power plant [illegible] and apartment for employees at Montana State [illegible] [illegible] to [illegible] Constr. Co., [illegible] Helena Ave., [illegible] $1,852,893; [illegible] for power house, [illegible] and apartment to [illegible] & [illegible] Co., 406 E. Park Ave., Anaconda. $260,270. Bids 7/27. CD 6/29.

▲ **N. J., Trenton**—LABORATORY—U. S. Navy Dpt., Bureau of Yards & Docks, Admin. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] State St., Trenton. $3,044,927. [illegible] CD 6/24.

▲ **O., Cleveland**—[illegible] [illegible] story [illegible] brick [illegible] [illegible] [illegible] [illegible] at 3329 Saratoga Rd., to Schirmer Peterson Co., 6830 Beaver Ave., Cleveland. $1,729,515. Est. $2,400,000. Bids 7/13, awarded 7/17. CD 6/27.

O., Elyria—HOSPITAL ADDN., etc.—Elyria Memorial Hospital, 630 E. River St., hospital addn. and alterations, to T. J. Horne Co., 435 Hamilton Ave., Lorain. $870,500. Est. $1,411,000. Bids 5/23, awarded 7/26. CD 6/6, under LB.

▲ † **Okla., Oklahoma City**—HOSPITAL—Veterans Admin., Vermont Ave. between H & I Sts., N. W., Wash. 25, D. C., group of buildings for Veterans Hospital, to Robert E. McKee General Contractor, Inc., 2700 [illegible] Rd., Dallas, Tex. $7,024,000. Bids 7/[illegible], awarded 7/[illegible]. CD 7/27, under LB.

▲ **Va., Lynchburg**—HIGH SCHOOL—Bd. Educ., Lynchburg, high school to Goode Constr. Corp. [illegible] Bldg., Charlotte, N. C. Approx. $2,000,000. Bids 6/27. CD 7/6, under LB.

Wash., Ellensburg—STUDENT UNION, etc.—Central Washington College of Educ., [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] to [illegible] [illegible] [illegible] [illegible] [illegible] St., Tacoma. $641,220. Est. $[illegible]. Bids 7/[illegible]. CD [illegible], under LB.

▲ **Wash., Tacoma**—SANATORIUM—Pierce Co. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 5. Tacoma Way, Tacoma. $1,792,519. Bids 6/26. CD 6/[illegible], under LB.

▲ **Wis., Madison**—LIBRARY—University of Wisconsin, [illegible] [illegible] Memorial Library, to [illegible] [illegible] Co., [illegible] [illegible] St., [illegible] Ill. $2,283,700. Bids 6/[illegible]. Awarded 7/[illegible]. CD 7/21, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

▲ **O., Euclid**—HOSPITAL—B. A. [illegible] [illegible] Hospital, 701 Parkard Dr., [illegible] [illegible] story [illegible], 172-bed general hospital at [illegible] Dr. and E. [illegible] St. $3,[illegible]. [illegible] [illegible] & [illegible] [illegible] Bldg., Cleveland, archts. [illegible] [illegible] [illegible] Bldg., Cleveland, engrs. [illegible] [illegible]. CD 7/13.

▲ **Ill., Chicago**—APARTMENTS—B.A. 8/24—[illegible] [illegible] Homes, Gladys and Lavergne Sts., Zone 44, sponsored by Community Development Trust, 39 S. State St., [illegible] five story [illegible] and [illegible] story [illegible] 452 unit apartments. [illegible] Holsman, Holsman, Klekamp & Taylor, 39 S. State St., Zone 3, archts. CD 7/[illegible].

▲ **Va., Danville**—HOSPITAL, NURSES' HOME—B.A. 8/24—The Memorial Hospital, c/o W. L. [illegible] Jr., [illegible] Danville, hospital alterations and addn. $1,250,000. Plans deposit $75; nurses home $[illegible]. Plans deposit $50. [illegible] & [illegible], 2117 [illegible] St., Richmond, archts. CD [illegible].

LOW BIDDERS

▲ **Ga., Augusta**—HOSPITAL—Sisters of St. Joseph of Carondelet, c/o [illegible] & [illegible] [illegible] [illegible] bids July 25, hospital, from [illegible] M. Lee Co., [illegible] Lynwood Ave. N. E., Atlanta. $1,357,132. CD 7/10.

CONTRACTS AWARDED

▲ **Calif., Bellflower**—DWELLINGS—[illegible] [illegible] [illegible] N. Hollywood Way, Burbank, 271 [illegible] [illegible] on Harvest [illegible], [illegible], [illegible] [illegible] Ave., [illegible], Foster, [illegible] and [illegible] Rd., [illegible] [illegible] and [illegible] [illegible] [illegible] $1,653,790. [illegible] [illegible], 4823 N. [illegible] [illegible] Blvd., Los Angeles, archt.

▲ **Calif., Los Angeles**—DWELLINGS—[illegible] Park, [illegible] [illegible] [illegible] 260 [illegible] dwellings [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Ave., [illegible] [illegible]. Approx. $1,744,800. [illegible] [illegible], [illegible] Beverly Glen Bl., Los Angeles, archt.

▲ **Calif., Santa Barbara**—DWELLINGS—[illegible] [illegible] Inc., 1560 [illegible] Blvd., Los Angeles, 310 dwellings to [illegible] [illegible], 1560 [illegible] Blvd., Los Angeles. Approx. $2,544,000. Arthur L. [illegible], 1840 [illegible] Blvd., Los Angeles, archt.

▲ **Fla., Jacksonville**—RESIDENCE UNITS—[illegible] [illegible] [illegible] [illegible] St., Zone 2, 1500 family [illegible] [illegible] of New [illegible] Blvd. and [illegible] [illegible] Estates [illegible] [illegible]. Approx. $5,000,000. [illegible] [illegible] & [illegible], 227 Park St., Jacksonville, Zone 1, archts. Awarded 7/26.

▲ **Ia., Des Moines**—APARTMENTS—Mr. & Mrs. [illegible] [illegible], [illegible] [illegible] St., [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Ave. [illegible] Terrace Apartments, to [illegible] [illegible] Co., Inc., [illegible] [illegible] Bldg., Des Moines. Approx. $1,000,000.

▲ **Minn., St. Paul**—[illegible] [illegible] Park, [illegible] [illegible] 62 and [illegible] Ave., general contract, 2 story [illegible] 19 apartment [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 3118 [illegible] Bldg., Minneapolis. $1,500,000. [illegible], [illegible] & [illegible], 1317 [illegible] Ave., archts.

▲ **O., Berea**—STORES, [illegible] [illegible] & [illegible] [illegible] [illegible] 1 story [illegible], brick [illegible] [illegible] 25 [illegible] [illegible] and parking [illegible] separate [illegible] $1,000,000. [illegible] [illegible] & [illegible] [illegible] [illegible], archts.

▲ **O., Boardman (near Youngstown)**—SHOPPING CENTER—[illegible] Co., 716 [illegible] Ave., Youngstown, [illegible] story shopping center, [illegible] 28 stores with [illegible] [illegible] [illegible] [illegible] Route 224 [illegible] [illegible] Ave. [illegible] $1,000,000.

▲ **O., Dayton**—HOSPITAL ADDN.—Miami Valley Hospital, Dr. Frank [illegible], 114 [illegible] Apple St., Dayton, 450 bed Miami Valley hospital addn., to Mason Constr. Co., 331 N. Ludlow St., Dayton. Approx. $4,500,000. CD 11/17/49.

▲ **Tex., Fort Worth**—HOUSING—Dpt. Air Corps, Fort Worth, constr., manage and finance 620 rental housing units at Carswell Air Force Base, to [illegible] [illegible] c/o Raymond E. Buck, 1220 Broad St. $5,045,380. [illegible] [illegible] CD 4/23, under LB.

INDUSTRIAL BUILDINGS

BIDS ASKED

Ill., Skokie—FACTORY—B.A. [illegible]—[illegible] M. [illegible], [illegible], 27 E. Monroe St., Chicago, Zone 3, 1 story [illegible] sq. ft. steel, brick, concrete factory. $[illegible]. CD [illegible].

Ill., Peoria—WAREHOUSE—B.A. [illegible]—[illegible] Inc., 1914 [illegible] [illegible] [illegible] [illegible] warehouse and [illegible] [illegible] for [illegible] [illegible] [illegible] [illegible] A. [illegible] c/o owner, engr.

▲ **Ill., Chicago**—[illegible]—[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Sts., Zone [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] ft., steel, brick [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] $10,000,000. Alexander D. [illegible], 2 [illegible] St., New York, N. Y., archt. and [illegible] [illegible] [illegible] [illegible] St., Chicago, Zone [illegible], [illegible] [illegible] CD [illegible].

N. J., Trenton—[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Ave., [illegible]. Approx. $[illegible].

Pa., Conshohocken—[illegible] [illegible]—[illegible] [illegible] [illegible] [illegible] [illegible] Co., Conshohocken, [illegible] [illegible] [illegible] Approx. $[illegible]. [illegible] [illegible] [illegible] [illegible] engr.

Tex., Dallas—PLANT—[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 4214 N. W. [illegible] [illegible] [illegible] steel plant. $[illegible]. [illegible] [illegible], [illegible] [illegible] [illegible], archt. CD 7/24.

CONTRACTS AWARDED

▲ **Ill., Chicago**—WAREHOUSE—[illegible] [illegible] [illegible] [illegible] North Ave., Zone 51, [illegible] [illegible] sq. ft. warehouse and office, to [illegible] [illegible] [illegible] [illegible] [illegible] St., Zone 51. $1,000,000. [illegible] [illegible] Awarded 7/24. CD 7/7.

▲ **Ky., Brandenburg**—PLANT—[illegible] [illegible] [illegible] [illegible] Bldg., Baltimore, Md., design and construction for [illegible] of natural gas [illegible] [illegible] anhydrous ammonia, to [illegible] [illegible] [illegible] & [illegible] Co., [illegible] [illegible] St., Boston, Mass. and Stone & Webster Engr. Corp., [illegible] Broadway, New York, N. Y. Total est. cost $13,000,000. CD [illegible].

▲ **O., Cuyahoga Heights**—PLANT—Ford Motor Co., 3000 Schaefer St., Dearborn, Mich., [illegible] sq. ft. [illegible] distribution wholesale plant, to Sam W. Emerson Co., 1836 Euclid Ave., Cleveland. Approx. $1,500,000.

UNCLASSIFIED

BIDS ASKED

▲ **N. Y., Long Island City**—SUBWAY TUNNEL—[illegible] [illegible] Bd. Transportation, 250 Hudson St., New York, N. Y., [illegible] [illegible] [illegible] to [illegible] [illegible] [illegible] [illegible] [illegible] 1 and 2. $10,000,000. CD [illegible].

CONTRACTS AWARDED

▲ **Arizona**—NATURAL GAS LINES—El Paso Natural Gas Co., [illegible] [illegible], El Paso, Tex., [illegible] [illegible] [illegible] natural gas line, [illegible] [illegible]. $1,750,000.

† **North Dakota**—TRANSMISSION LINES—Bureau Reclamation, Dpt. Interior, Bismarck, Garrison-Voltaire, Devils Lake-Dakota and Jamestown-Valley City 115 kilovolt transmission lines, Transmission Div., Missouri River Basin Proj., [illegible] [illegible] to [illegible] [illegible] [illegible] [illegible] [illegible]. $252,500. Est. $[illegible]. Bids [illegible], awarded 7/24. CD 7/[illegible], under LB.

Ohio, Michigan and Ontario—PIPE LINE—[illegible] Pipe Line Co., [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] petroleum products pipe line from Toledo, [illegible] [illegible] [illegible] to Detroit, [illegible] from [illegible] [illegible], [illegible] [illegible] St. Clair River at Marysville, [illegible] [illegible] [illegible] ft. deep, with [illegible] [illegible] [illegible] [illegible] below [illegible] [illegible] to Sarnia, [illegible] [illegible] [illegible] with [illegible] [illegible] [illegible] [illegible] through the line to H. L. Gentry Constr. Co., [illegible] Mich.

Okla., Canton—GRAIN ELEVATOR—Canton Grain Co., Canton, 500,000 bushel capacity grain elevator, to [illegible] Constr. Co., Bethany. $220,000. Est. $[illegible]. Horner & Wyatt, Dwight Bldg., Kansas City, Mo., engrs. Awarded 7/12.

Okla., Oklahoma City—WAREHOUSE—Lee McNeill [illegible], 1810 N.W. 4 St., Zone 7, [illegible] ft. warehouse at [illegible] N. [illegible] St., to R. R. [illegible] Co., [illegible], Zone 4. $226,000. Est. $[illegible]. [illegible] [illegible] Terminal Bldg., Zone 2, archt. Awarded 7/[illegible].

Tenn., Chattanooga—WAREHOUSE—M. [illegible] [illegible] [illegible] Co., [illegible] [illegible] St., Columbus, [illegible] [illegible] ft., [illegible] sq. ft. warehouse [illegible] [illegible] [illegible] Sears, Roebuck & Co., [illegible] Market St., [illegible].

Tex., Lubbock—SHOP, WAREHOUSE—[illegible] [illegible] [illegible], [illegible] Avenue Q, [illegible] [illegible] [illegible] warehouse to Robert [illegible] [illegible] [illegible] Ave. [illegible] $75,159. [illegible] & [illegible], [illegible] Bldg., [illegible].

PROPOSED PROJECTS

WATER SUPPLY

Ind., **Anderson**—Bd. P. Wks., Lester MacDonald, mayor, City Hall, rehabilitating municipal water sys., incl. new wells, 14 in. water line mains to industrial distr., service mains, 1,500,000 gal. and 200,000 gal. capacities elevated steel tanks, $2,000,000. Chas. W. Cole & Son, 220 W. LaSalle St., South Bend, consult. engrs.

Okla., **Dewey**—City, Dewey, voted bonds, WW extens., $125,000. Wool & Craig, Philtower Bldg., Tulsa, consult. engrs.

Okla., **Edmond**—City, Edmond, water main extens., $130,000. Lee V. Bush & Co., Colcord Bldg., Oklahoma City, consult. engrs.

Tex., **Midland**—Colorado River Municipal Water Dist., Big Spring, 50 mi. main pipe line from point in Martin Co. to limits of Midland, $400,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs.

SEWERS, WASTE DISPOSAL

Ill., **Ottawa**—City, sewerage proj., $2,030,000.

Mo., **Berkeley City (St. Louis 21, P. O.)**—City, Edw. A. Walsh, mayor, City Hall, Airport Rd. and Helen Ave., voted $650,000 bonds, trunk and lateral sewers, 2 disposal plants with auxiliaries, appurtenances, etc. Russell & Axon, 408 Olive St., St. Louis, Zone 2, consult. engrs. CD 6/22.

BRIDGES

Ala., **Columbiana**—Shelby Co., bridge facilities, Proj. No. I.P. 1019, $622,500. Polk, Powell & Hendon, Stallings Bldg., Birmingham, consult. engrs.

Mo., **Kansas City**—City, City Hall, conversion Milwaukee R. R. Bridge to 2-way highway span, $482,000. Howard, Needles, Tammen & Bergendoff, 921 Walnut St., Zone 6, consult. engrs. CD 8/28/47.

▲ N. B., **St. John**—Municipality, harbor bridge from end of [illegible] St. to Navy Island, $2,000,000. [illegible] Pratley, 1172 St. Catherine St. W., Montreal, Can., engr. CD 1/28/46.

STREETS AND ROADS

Calif., **Los Angeles**—Bd. Supervs., Los Angeles Co., 501 Hall of Records, imprs. Elaine Ave., curbs, gutters, walks, Norwalk, $171,300. C. [illegible] Arnold, co. engr.

Ill., **East Moline**—City, bond election Aug. 21 for [illegible] paving City streets, $200,000.

Neb., **Omaha**—City, City Hall, [illegible] and Farnam Sts., pave parking areas at municipal stadium, $175,000. J. W. Woodbridge, City engr. CD 5/17/49.

Okla., **Okmulgee**—City, Okmulgee, bond election August [illegible] [illegible] highway, $180,000. Rex [illegible], McAlester, consult. engr.

Tex., **Houston**—Cashmere Gardens Development Co., Inc., c/o Sam Z. Miller, 2401 Blodgett St., streets, [illegible] concrete paving, incl. concrete sidewalks, [illegible] Rd., [illegible] Rd. extens., etc., $100,000.

EARTHWORK, WATERWAYS

▲† **Oklahoma**—[illegible] Engr., P. O. Box [illegible], Tulsa, Zone [illegible] [illegible] Cherokee County [illegible] Tenkiller Ferry Dam, $175,000; switchyard and mech. [illegible], $300,000; power house [illegible], $600,000; [illegible] and [illegible], $350,000; [illegible], installing switchboard and generator [illegible], $180,000; all foregoing for [illegible] Dam on [illegible] River, [illegible], Muskogee Co.

▲† **Oklahoma**—[illegible] Engr., P. O. Box 61, Tulsa, Zone 2, [illegible] and [illegible] for operation Fort Gibson Reservoir and power plant, $300,000; [illegible] along [illegible] Fort Gibson [illegible], $125,000; [illegible] County roads, $200,000; relocation M. K. & T. Ry. [illegible] Fort Gibson Reservoir, $2,000,000; [illegible] Fort Gibson Reservoir, $350,000; all foregoing Fort Gibson, Muskogee Co.

PUBLIC BUILDINGS

▲ Ala., **Dothan**—HOSPITAL—[illegible] [illegible] & [illegible], [illegible] Bldg., Montgomery, [illegible] Approx. $1,000,000.

Calif., **Pittsburg**—SCHOOL—Pittsburg [illegible] School Dist. [illegible] by A. A. [illegible] & A. A. [illegible] [illegible] Market St., San Francisco [illegible] Pittsburg Heights, $375,000 [illegible] [illegible], 2611 [illegible] St., Sacramento [illegible] Pittsburg High School, $260,000. [illegible]

Fla., **Chattahoochee** — PSYCHIATRIC — State Imprvt. Comm., plan by Guy C. Fulton, state archt., Peabody Hall, University of Gainesville, psychiatric bldg. at State Hospital, $650,000.

▲ Ill., **Olney**—HOSPITAL—Richland Memorial Hospital, c/o S. E. Davis, chn. Bd. Supervs., Courthouse; plans by Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, Zone 11, 100 bed, brick, concrete, steel general hospital, $1,000,000. CD 10/31.

La., **New Iberia**—SCHOOL IMPRVS.—Iberia Parish School Bd., New Iberia, voted bonds for school imprvs., Dist. 1, $725,000. CD 6/29.

Mass., **Brookline**—HOUSING—Town of Brookline Housing Auth., plans by I. Richmond & C. Goldberg, 16 Arlington St., Boston, 3 story, brick, 68 unit Veterans Housing Proj. 200-3, Bowditch Estate, Harvard Ave. Approx. $650,000. CD 6/5.

N. J., **Hackensack**—SCHOOL—Bergen Co., Hackensack, voted bonds, county vocational school, $2,205,000.

▲ N. J., **Paterson**—HOUSING—Public Housing Auth., 29 Harris St., plans by Kelly & Gruzen, 80 Fifth Ave., New York, N. Y., housing Proj., on 22 Ave. site, $5,000,000.

O., **Deer Park**—HIGH SCHOOL—Bd. Educ., Herman E. Helmichen, pres., Plainfield Pike, Deer Park, Cincinnati, Zone 36; plans by Grunkemeyer & Sullivan & Assoc., 3717 Eastern Ave., Cincinnati, 2 story, bsmnt., brick high school and gymnasium addn., $697,000. CD 11/23/45.

O., **Franklin**—SCHOOL—Carlisle Bd. Educ., C. E. Brandenberg, clk., 116 Elm St.; plans by Walker-Norwick & Templin, American Bldg., 4 S. Main St., Dayton, 1 story, bsmnt., brick, Carlisle Local School alterations, addns., 3 mi. west of here, $400,000.

▲ O., **Hamilton**—ELECTRIC PLANT, etc.—City, G. F. Schwalm, act. city mgr., Municipal Bldg., municipal electric plant and distr. sys. addn., Div. A, switching station on N. 3 St., Div. B, modification to underground duct and cable sys., incl. miscellaneous work, etc., Substation 2, Contr. 20, $1,237,000. Emery, Marker & Emery, 510 Toledo Trust Bldg., Toledo, consult. engrs. CD 10/24/45.

O., **Monclova** — HIGH SCHOOL — Monclova-Waterville-Whitehouse School Dist., Monclova, plans by Howard Maynard, Bellefontaine, Union High School. Approx. $1,000,000.

▲ O., **Oxford**—STUDENT CENTER BLDG.—Dpt. Pub. Wks., S. O. Linzell, Dir., State Office Bldg., S. Front St., Columbus; plans by Charles F. Cellarius, 111 E. 4 St., Cincinnati, 2 story, bsmnt., brick student center bldg., Campus Miami University, $1,000,000. H. G. Allen, c/o owner, archt.

O., **Toledo**—HEALTH CENTER—City, A. V. Finch, city mgr., Safety Bldg., plans by Peterson, Hoffman & Barber, Spitzer Bldg., health center bldg. in Civic Center, $750,000. CD 10/4/45.

Okla., **Norman** — HIGH SCHOOL — Bd. Educ., Norman, plans by Joseph [illegible] Smay, Norman, high school, $600,000.

▲ S. C., **Spartanburg**—COURTHOUSE—Spartanburg Co., Spartanburg, plans by [illegible] Woodward, Spartanburg, courthouse, $1,000,000.

COMMERCIAL BUILDINGS

▲ Calif., **Los Angeles**—DWELLINGS—Brentwood Builders, 1150 S. Beverly Dr., plans by Edward H. Fickett, [illegible] Wilshire Blvd., [illegible] dwellings at [illegible] and [illegible] Sts., $3,400,000.

▲ Calif., **Los Angeles**—DWELLINGS—[illegible] Park Development Co., 1150 S. Beverly Dr., Los Angeles, plans by Edward H. Fickett, [illegible] Wilshire Blvd., [illegible] dwellings [illegible] Blvd. and [illegible] St., $1,926,000.

▲ Tex., **Dallas**—DWELLINGS—[illegible] Roberts & Sons, 1922 W. Jefferson St., 320 brick dwellings, [illegible] [illegible] acre tract, adjacent to [illegible] Estates, Oak Cliff, $3,000,000. CD [illegible]

▲ Tex., **Fort Worth**—MEDICAL BUILDING—Medical & Professional Bldg., [illegible] P. [illegible] [illegible] sq. ft. [illegible] Approx. $2,500,000.

▲ Tex., **Fort Worth**—[illegible] dwellings [illegible] $3,500,000; [illegible] $1,500,000.

▲ Tex., **Houston**—DWELLINGS—[illegible] Development Co., Inc., c/o Sam Z. Miller, 2401 Blodgett St., [illegible] dwellings [illegible] $1,600,000; [illegible] dwellings for Negroes, [illegible] Rd., [illegible] $3,000,000.

▲ Tex., **Houston**—[illegible] $4,000,000.

▲ Tex., **Houston**—DWELLINGS—[illegible] $1,750,000.

▲ Tex., **Lubbock**—DWELLINGS—Urban Development [illegible] $1,750,000; [illegible] $2,000,000 [illegible]

INDUSTRIAL BUILDINGS

Ala., **Birmingham**—GARAGE—Dixie Drive-It Yourself Co., c/o Van Keuren, Davis & Co., archts., American Life Bldg., Birmingham, auto garage, $300,000. CD 5/24.

Calif., **Maywood**—FACTORY, etc.—Baker Oil Tools, Inc., 6000 S. Boyle Ave., Vernon, 1 and 2 story 178,000 sq. ft. steel frame factory and office, $700,000. David R. Edwards, 5911 Pine Ave., engr.

▲ La., **Sterlington**—PLANT ADDN.—Commercial Solvents Corp., 17 E. 42 St., New York, N. Y., plant addn., $1,000,000.

Neb., **Omaha**—PLANT—Omaha Cold Storage Co., 8 and Farnam Sts., plans by J. T. Allan, Brandeis Theatre Bldg., plant addn., $400,000.

O., **Akron**—PARKING BLDG.—Akron Real Estate Agency Co., R. L. Miller, pres., United Bldg., four deck parking bldg., 240,000 sq. ft. at Quaker and Bowery Sts., $350,000.

O., **Bucyrus**—FACTORY—M. G. Nussbaum, pres., Swan Rubber Co., Bucyrus, 4 story, 42x165 ft. factory adn.

O., **Columbus**—TERMINAL—Eastern Motor Dispatch, Inc., H. H. Buel, pres., 1260 Cleveland Ave., motor freight terminal on 7 acre tract on W. Mound St., incl. terminal, office, separate garage and service bldg.

O., **Windham**—PLANT—Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa., refractories plant 175x1,500 ft. steel main bldg., two 500 ft. long tunnel kilns, on 41-acre site on east side of city, just north of Erie RR's main line.

UNCLASSIFIED

Calif., **Los Angeles**—MAINTENANCE YARD—Bd. Supervs., Los Angeles Co., 501 Hall of Records, plans by Herman Charles Light, 7551 Melrose Ave., Los Angeles, road dept. maintenance yard, Hondo, $447,000.

Ill., **Aurora**—SWIMMING POOLS—City, one to 3 swimming pools. Est. $400,000. G. H. Deuchler, Aurora, consult. engr. CD 1/30/46.

Ind., **Linton**—GAS DISTRIBUTION SYSTEM—B. P. Wks., A. M. Grass, mayor and chn., City Hall, rehabilitating gas distr. sys., incl. new 4 in. c.i. mains, repairing, replacing mains, service lines, regulator station, $180,000. J. B. Wilson, 10 W. Ohio St., Indianapolis, consult. engr.

Ky., **Lexington**—MOTEL—W. F. Davis Corp., c/o N. Warfield Gratz, archt., 148 Barr St., 1 and 2 story, 52 unit L shaped motel, $350,000.

Mississippi—RURAL DISTRIBUTION LINES—Alcorn Electric Power Assn., Corinth, 126 mi. rural distr. lines sys. imprvs., Alcorn Co., $250,000. Allen & Hoshall, 65 McCall Pl., Memphis, Tenn., consult. engrs. CD 2/28.

Mo., **St. Louis Co.**—DRIVE-IN THEATRE—Fred Wehrenberg Circuit, c/o Paul Krueger, Cinderella Theatre Bldg., 2725 Cherokee St., Zone 18, 750 car drive-in motion picture theatre, on 22 acree site, Lemay Ferry and Buckley Rds., about 2 miles south of Lemay. Approx. $150,000.

Nebraska — RURAL DISTRIBUTION LINES — Panhandle Rural Electric Membership Assn., Alliance, rural distr. lines, Arthur Co., $420,000. Raymond H. Reel & Co., Columbus, consult. engr.

▲† N. C., **Camp Lejeune**—RAILROAD SPUR—Pub. Wks. Office Bldg., [illegible] Marine Barracks, Camp Lejeune, railroad spur from Camp Lejeune to Cherry Point, $3,000,000.

▲ **Ohio**—PIPE LINE—Miami Valley Corp., jointly owned by Pure Oil Co., 2401 Independence St., the Standard Oil Co. of Ohio, Midland Bldg., both Cleveland, 48 mi. 8 in. pipe line between Dayton and Cincinnati, $1,400,000.

O., **Silverton**—SWIMMING POOL, etc.—Village, [illegible] [illegible], mayor, [illegible] swimming pool, bathhouse, $100,000. [illegible] & [illegible], [illegible] St., Cincinnati, consult. engrs.

Oklahoma — RURAL DISTRIBUTION LINES — [illegible] Electric Cooperative Assn., [illegible] mi. rural distr. lines, [illegible] Co., $975,000. J. R. Taylor & Assoc., [illegible] 11 St., Tulsa, consult. engrs. CD 10/27/48.

Tennessee—RURAL DISTRIBUTION LINES—[illegible] Electric Cooperative, [illegible] mi. rural distr. lines [illegible] $340,000. [illegible] Bldg., Nashville, consult. engr. CD [illegible]

Texas—PIPE LINES—[illegible] $215,000.

Texas—[illegible] LINES—Magnolia Petroleum [illegible] [illegible] $200,000.

Texas—[illegible] LINES—[illegible] $175,000.

Tex., **Houston**—[illegible] Robert W. [illegible] & Assoc., [illegible] $100,000; [illegible] swimming pool, $75,000; [illegible] park and playgrounds, $75,000 [illegible] Robert M. & Robert W. [illegible] 1st Nat. Bank Bldg., consult. engrs.

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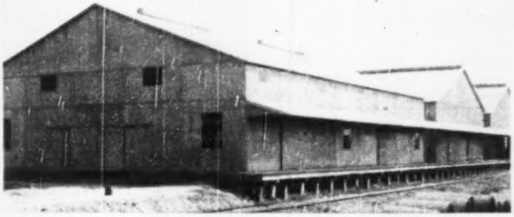

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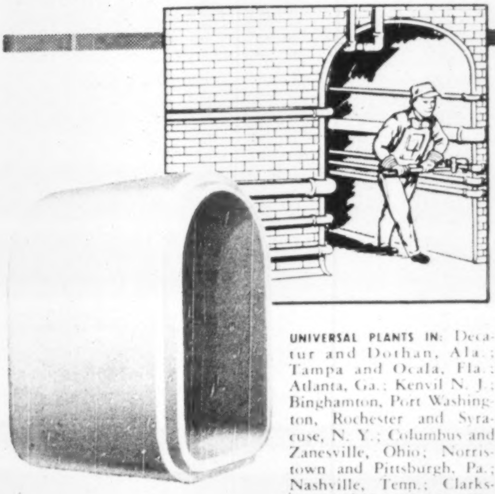

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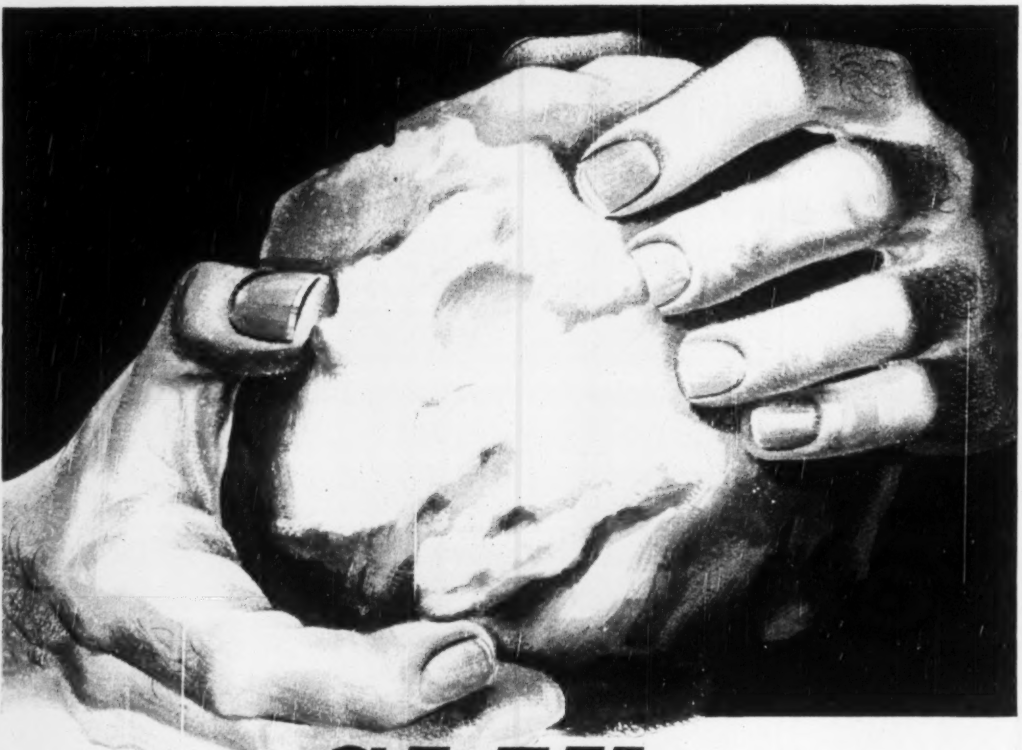

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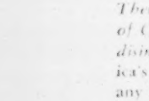

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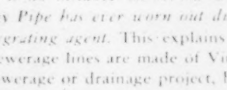

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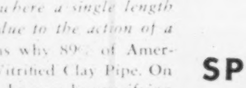

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CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

BIDS ASKED

Md., Hyattsville—B.A. 8-24—Washington Suburban Sanitary Comm., Hamilton St. [illegible] water meters, etc. ENR [illegible] CD 10-20-49.

O., Lakemore—B.A. 8-14 [illegible] Lakemore [illegible] Akron, engr.

Tex., South Houston—B.A. [illegible] water [illegible] engr.

Ont., Toronto—B.A. [illegible] North York [illegible] Toronto [illegible] Approx. $[illegible] engr.

La., Hahnville—B.A. [illegible] Waterworks Distr. 2, Courthouse [illegible] water treatment plant [illegible]

O., Toledo—B.A. [illegible]

Wis., Butler—B.A. [illegible]

Calif., [illegible]—B.A. [illegible]

Ala., Bay Minette—B.A. [illegible] City [illegible]

Mass., Lynn—B.A. [illegible]

Minn., Lake Lillian—B.A. [illegible]

Calif., San Francisco—B.A. [illegible]

O., Salem—B.A. [illegible]

N. Y., Niagara Falls—B.A. [illegible]

LOW BIDDERS

Md., Glen Burnie—[illegible] $44,349. [illegible]

Tex., Georgetown—City, [illegible] $59,280. [illegible]

Wis., La Valle—Village, [illegible] water system [illegible] $62,417.

CONTRACTS AWARDED

Fla., Hialeah—City, [illegible] $270,750. [illegible]

Fla., Jacksonville—[illegible] St., Zone 2, [illegible] $100,000. [illegible] Awarded [illegible]

▲ La., Kingsville—[illegible] Water Works [illegible] Fort Worth, Tex. $1,114,000. Awarded [illegible]

Tex., Fort Worth—[illegible] $58,120. Carter & Burgess, [illegible]

Tex., Houston—[illegible] $33,100. [illegible]

SEWERS, WASTE DISPOSAL

BIDS ASKED

▲ Mass., Fall River—B.A. [illegible] City Sewer [illegible] approx. $1,[illegible] [illegible] CD 12-21-49.

Miss., Greenville—B.A. [illegible]

Wis., Butler—B.A. [illegible] Milwaukee, engr. [illegible]

▲ Pa., Philadelphia—B.A. [illegible]

N. J., Millburn—B.A. 8-21 [illegible]

Nebr., McCook—B.A. [illegible]

Calif., Chester—B.A. [illegible]

LOW BIDDERS

Calif., San Francisco—Dept. Pub. Wks., City Hall, [illegible] $124,393. [illegible]

Ia., Vinton—City [illegible] $150,000 [illegible] $65,000 [illegible]

Tex., Ballinger—[illegible] $144,647. [illegible]

Tex., Corpus Christi—[illegible] $123,000. [illegible]

Tex., Pasadena—City, [illegible] $198,682. [illegible]

CONTRACTS AWARDED

Calif., Centerville—[illegible] $88,364. [illegible]

Minn., Moorhead—City, [illegible] $90,240. [illegible]

Pa., Ellwood City—[illegible] $100,000. [illegible]

Tex., Fort Worth—[illegible] $69,500. Carter & Burgess, [illegible]

Tex., Houston—[illegible] $66,500. [illegible]

Tex., Houston—[illegible] $50,000. [illegible] $59,500. [illegible]

Wis., Racine—City, [illegible] $613,388, [illegible] $69,931. [illegible]

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

August 16
Maine
August 17
Kansas
Michigan
August 18
Kansas
August 22
Wisconsin
August 23
California
August 24
California
August 25
Maryland
August 30
California
August 31
California

† Wyoming—B.A. 8-16—U. S. Forest Service, P. O. Bldg., Denver, Colo. Johnson Co.: constr. North Clear River Bridges 1 and 2 [illegible] Station Rd., grading, drainage [illegible] of Muddy Creek Rd., Big Horn National Forest. E. P. [illegible], regional forester, engr.

Fla., Miami—B.A. 8-22—Dade Co., c/o county engr., Courthouse. [illegible] Drive Bridge over Coral Gables Waterway. Plans deposit $15.

LOW BIDDERS

Indiana—State Hy. Comm., Indianapolis, July 27, [illegible] Fort Wayne, $119,993, Est. $[illegible]

Mo., Kansas City—[illegible] $437,578, [illegible]

CONTRACTS AWARDED

▲ Delaware—State Hy. Dept., Wilmington, [illegible] Delaware Memorial Bridge over Delaware River [illegible] New Castle Co., [illegible] $1,132,550. [illegible]

South Dakota—State Hy. Comm., Pierre, [illegible] Rapid City $[illegible]

Ontario—Dept. Highways, Toronto, [illegible] Toronto. Approx. $175,000. [illegible]

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

August 15
Iowa
Maryland
Massachusetts
Texas
Utah
West Virginia
Wisconsin
August 16
Texas
August 17
Kansas
Virginia
August 18
Kansas
Virginia
August 22
Massachusetts
Wisconsin
August 23
California
Delaware
August 30
California
August 31
California

Tex., Altair—B.A. [illegible] streets and road [illegible] Eagle Lake, engr.

Calif., Redwood City—B.A. [illegible] City Hall, city engr. [illegible]

LOW BIDDERS

▲ Massachusetts—Commonwealth of Mass., Dept. Pub. Wks., Boston, July 25, for grading, concrete [illegible] Malden, $2,699,700 [illegible] Beverly, from [illegible] Chelsea, $86,597 [illegible] Dartmouth, from [illegible] Newport, R. I., $138,152 [illegible] Hatfield, from [illegible] Greenfield, $68,428 [illegible] Rte. 122-A, [illegible] Worcester $195,569 [illegible] South Hadley, from [illegible] 480 Hampden St., Holyoke $196,485. CD 7-20.

▲ Ohio—State Hy. Dept., Columbus, July 27, [illegible] sheet pile cells capped with concrete, etc., from Great Lakes Dredge & Dock Co., [illegible] Cleveland, $1,364,004, est. $[illegible] Clifton Blvd., Lakewood, [illegible] W. Clifton Blvd., [illegible] Midland Bank Bldg., Cleveland, $694,227, est. $[illegible] grading, etc. [illegible] steel, concrete Bridge No. [illegible] S. R. 174, Lake Co., from Ferguson & [illegible] Co., Inc., Keystone Bldg., Pittsburgh, Pa. $510,856. Est. $637,900. CD 7/14.

▲ Pennsylvania—State Hy. Dept., Harrisburg, [illegible] 2 plate girder bridges [illegible] $2,525,321. CD [illegible]

EARTHWORK, WATERWAYS

BIDS ASKED

† **Nebraska**—B.A. 8/17—Bureau Reclamation, Dpt. Interior, Trenton, earthwork and structures, except bridge superstructures, relocation of Chicago, Burlington & Quincy Railroad, Trenton Dam, Frenchman-Cambridge Div., Missouri River Basin Proj. Spec. 3112. L. N. McClellan, ch. engr. Extended date. CD 7/10.

† **North Dakota**—B.A. 8/18—U. S. Eng., Ft. Lincoln, Box 300, Bismarck, overlock facilities, Garrison Dam and Reservoir, Missouri River, Riverdale, Serial No. CIVENG-32-015-50-8. CD 6/1/44.

† **Oregon**—B.A. 8/18—U. S. Eng., Pittock Block, Portland, design, manufacture & delivery of 20,000 kva ac generator for Big Cliff dam powerhouse on north Santiam River. Extended date. CD 7/24.

Wash., **Olympia**—B.A. 8/18—State Capitol Committee, Olympia, Unit No. 2 of Des Chutes Basin proj., incl. 17,000 cu. yds. excavation 442,000 cu. yds. common borrow for embankment, etc. for unpaved parkway or roadway. Approx. $50,000. Plans deposit $35. J. W. Carey-H. W. Kramer & Assocs., 1917 1 Ave., Seattle, Zone 1, engrs. CD 12/9/47.

† **Illinois**—B.A. about 8/22—U. S. Eng., 819 W. Broadway, Louisville, Zone 3, Ky., approx. 90,000 cu. yd. levee embankment, 9 acres fertilizing, seeding, etc. for Captain Point Levee repairs, Jasper Co., CIVENG 15-029-51-10.

† **California**—B.A. 8/22—Bureau Reclamation, Dpt. Interior, Box 570, Tracy, headworks, pilot fish screen structures and 13.8 kilowatt distr. line, Delta Mendota Canal, Spec. R2-117, near Tracy, San Joaquin Co.

Tex., **Refugio**—B.A. 8/24—Refugio County Drainage Distr. No. 1, Refugio, 50,000 acre drainage in Precinct No. 4, incl. 700,000 cu. yd. excav., 71 structures, etc. Approx. $200,000. Plans deposit $5.50. Frank T. Draught, 117 W. Pecan St., San Antonio, engr. CD 11/15/49.

† **Illinois**—B.A. about 8/25—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, Ky., approx. 4,900 cu. yd. levee embankment, 2 acres fertilizing and seeding, etc. for Hollenbeck Levee Repairs, Clark Co., CIVENG 15-029-51-14.

† **Arkansas and Louisiana**—B.A. 8/29—U. S. Eng., foot of Prytania St., New Orleans, 9, La., clearing, snagging 3.41 mi. and excavating approx. 140,000 cu. yds. material from Posten Bayou, Ark. and La., Mile 2.0 to Mile 12.17. Serial No. CIVENG-16-047-51-19. CD 12/24/41.

† **Washington**—B.A. 8/29—Bureau Reclamation, Dpt. Interior, Bldg. 1 A, Denver Federal Center, Denver, Colo., furnish and del. f.o.b. cars at shipping point or f.o.b. cars at Othello, Wash., radial gates, guide frames, pine bearings, gate tilts, wall plates, radial-gate hoists for Potholes East Canal, Station 1158 plus 00, Columbia Basin Proj. Spec. 3138. L. N. McClellan, ch. engr.

† **Washington**—B.A. 8/31—U. S. Eng., 19 E. Poplar St., Walla Walla, constr. section facilities at relocated Juniper Section Grounds and move tool house and fuel storage tank from existing Juniper Section Grounds to relocated Section Grounds along the south bank of Columbia River approx. 8½ mi. southwesterly from Wallula. Serial No. CIVENG-35-164-51-10.

Illinois—B.A. 9/1—U. S. Eng., 520 Merchandise Mart, Chicago, Zone 54, repair shore arm extension 1,200 lin. ft. exterior breakwater, 100 lin. ft. inner breakwater, 17,000 sq. ft. steel sheet piling, 300 tons gravel fill, 4,500 cu. yds. concrete, 20,300 lbs. misc. metal, located in Chicago Harbor, Chicago.

LOW BIDDERS

† **Louisiana**—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, July 21, approx. 280,000 cu. yd. semi-compacted earthworks, incl. grading, surf., approx. 8.190 mi. roadway, West Atchafalaya Basin Protection Levee, St. Mary Parish, Inv. No. 117, from Enfanger & Bean, 319 Main St., Plaquemine. $237,240. CD 6/28.

▲† **Louisiana**—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, Aug. 1, constr. superstructure of gated portion of Morganza control structure, New Orleans Dist., Black Jasper Parish, CIVENG-16-047-50-284, from Farnsworth & Chambers Co., Box 74, Houston, Tex. $5,269,069. CD 7/17.

† **Missouri**—U. S. Eng., 601 Pershing Bldg., Kansas City, Zone 6, Mo., approx. 10,200 lin. ft. dike and revetment, Portage to Mallinckrodt Bends, near St. Charles, along Missouri River, CIVENG-23-028-51-2, from Patton-Tully Transportation Co., 1242 N. 2, Memphis. $267,101. Est. $316,395. CD 6/21.

CONTRACTS AWARDED

Minn., **Windom**—Cottonwood Co., 10 J. Rudolph, bridge, county Distr. 16, to Gieske Constr. Co., Windom. $29,002. Bids 7/31. CD 6/22.

AIRPORTS

LOW BIDDERS

† Calif., **Alameda**—CLAM SHELL DREDGING, U. S. Eng., 180 New Montgomery St., San Francisco, dredging and shell dredging at Benton Ave. Naval Air Station, Spec. 04-293-51-1, from American Dredging Co., 1038 Market St., San Francisco. $45,380. CD 7/28.

Calif., **Oakland**—DRAINAGE, etc.—Bd. Port Commissioners, grading, pavements at Oakland Municipal Airport, from Gallagher & Burk Inc., 344 High St., Oakland. $60,000.

CONTRACTS AWARDED

▲ Mass., **East Boston**—RUNWAY—Commonwealth of Mass., State Airport Management, Logan Airport, airport runway extensions, etc., General Logan Airport, to V. Barletta Co., 10 Whipple Ave., Roslindale. $2,346,047. Awarded 7/27. Bids 7/14. CD 7/24.

PUBLIC BUILDINGS

BIDS ASKED

Kan., **Hays**—DORMITORY—B. A. 8/15—State Bd. Regents, National Bank of Topeka Bldg., Topeka, dormitory at State Teachers College. $336,000. C. O. L. Marshall, Topeka, state archt., Forsblom & Parks, Beacon Bldg., Wichita, assoc. archts. Extended date. CD 6/16.

† N. Y., **Brooklyn**—CHAPEL—B.A. 8/15—Veterans Admin., Munitions Bldg., Wash., 25, D. C., chapel in main bldg. No. 1, for Veterans Admin. Hospital, Fort Hamilton, Spec. No. 50109. Extended date. CD 6/30.

La., **Lake Charles**—FIRE STATIONS—B. A. 8/16—City, Lake Charles, constr. 2 fire stations. Plans deposit $15. Gabriel & Reames, 21 Raumain Bldg., archts. CD 6/18/47.

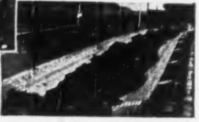
Minn., **St. Paul**—LAUNDRY—B.A. 8/18—State, Dpt. Admin., 19 State Capitol, 1 story, bsmnt. laundry at Gillette State Hospital, 1003 Ivy Ave. $105,000. W. M. Ingemann and M. V. Bergstedt, 345 Minnesota St., archts. CD 7/11.

Ore., **Salem**—TUBERCULOSIS TREATMENT UNIT—B. A. 8/18—Bd. Control, Capitol, Salem, 2 story, part bsmnt., 150x430 ft. wings, E-shaped 130 bed tuberculosis treatment unit at state hospital. $800,000. Plans deposit $150. Frank H. Struble, 381 State St., archt.

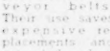
Calif., **Daly City**—AUDITORIUM, etc.—B. A. 8/21—City, City Hall, war memorial auditorium and recreation center. $295,000. Plans deposit $20. Mario Campi, 425 Bush St., San Francisco, archt. CD 10/7/49.

Wis., **Milwaukee**—SCHOOL ALTERATIONS—B. A. 8/21—Bd. Vocational & Adult Education, 1015 N. 6 St., Zone 3, vocational school alterations. $250,000 to $275,000. G. J. DeGelleke, 152 W. Wisconsin Ave., Zone 3, archt. CD 7/26.

KEEP YOUR CONVEYOR BELTS GOING



FLEXCO H D RIP PLATES are used in repairing rips and patching conveyor belts. Their use saves expensive replacements and extended shut-downs.



FLEXCO H D BELT FASTENERS make a strong tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

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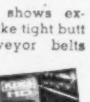
Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco. Also illustrates step by step the latest practice in repairing rips and putting in patches.



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FLEXCO HD BELT FASTENERS

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Minn., **Faribault**—DORMITORY etc.—B.A. 8/22—State Dpt. Admin., P. T. Peterson, dir. purchases, 19 State Capitol, three dormitories, addns. and alterations to heating plant at Minnesota School and Colony. $750,000. Plans deposit $30. Shifflet, Backstrom & Carter, 17 W. Franklin Ave., Minneapolis, archts., G. M. Orr Engr. Co., 1004 Marquette Ave., Minneapolis, engr. CD 6/30/49.

Tex., **Corsicana**—ADMINISTRATION—B. A. 8/22—Navarro Jr. College, Corsicana, 2 story, masonry administration bldg. Approx. $325,000. Plans deposit $25. W. G. Clarkson & Co., 819 Penn St., Fort Worth, archts. CD 2/27.

† **Alaska**, **Homer**—CLASSROOM ADDN.—B.A. 8/23—Dpt. Interior, Div. Territories and Island Possessions, Alaska Pub. Wks., Community Bldg., Juneau, rein. con. classroom addn. Proj. 50-A-3. $173,500. Plans deposit $25. V. C. Rivers, Central Bldg., Anchorage, archt. J. D. Argetsinger, dist. engr.

† **Alaska**, **Juneau**—LIBRARY—B.A. 8/23—Dpt. Interior, Div. of Territories & Island Possessions, Alaska Pub. Wks., Community Bldg., concrete library. Plans deposit $25. J. D. Argetsinger, dist. engr.

Fla., **Tampa**—HOUSING—B.A. 8/23—Tampa Housing Auth., c/o Norman F. Six, archt., Hillsboro Hotel Lobby, Tampa, Riverview Terrace Housing Proj., Fla. 3-6. CD 2/14.

N.C., **Fayetteville**—DORMITORIES, etc.—B.A. 8/23—Fayetteville State Teachers College, Dr. J. W. Seabrook, pres., Fayetteville, auditorium, 2 teachers dormitories, 3 girl's dormitories and alteration to dining hall, plans deposit $50 each, $10 for plg., htg. and electric. Marion A. Ham, Durham and Frank B. Simpson, 110½ Fayetteville St., Raleigh, archts. CD 9/23/49.

N. Y., **Yonkers**—ARMORY—B.A. 8/23—Bureau of Contracts & Accounts, State Office Bldg., Albany, state armory alterations. Plans deposit $5.

B.C., **Fort Nelson**—BARRACK BLOCK—B.A. 8/23—J. D. McCarthy, secy., Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., barrack block at R.C.A.F. Station. Approx. $320,000. CD 7/31.

Ga., **Cartersville**—SCHOOL—B.A. 8/24—City, high school. Plans deposit $25. Francis M. Daves & Assocs., 57 8 St. N. E., Atlanta, archts. CD 7/14.

La., **New Orleans**—SCHOOL—B.A. 8/24—Orleans Parish School Bd., 703 Carondelet St., brick, tile Lakeview Elementary School. $700,000. Plans deposit $25. Favrot, Reed, Mathes & Bergman, Nola Bldg., archts.

Tenn., **Martin**—RESIDENCE HALL—B.A. 8/25—John L. Nely, Jr., dir. office Executive Officer, Robert Meek, Martin, men's residence hall for University of Tennessee Junior College. Plans deposit $10. Daniel T. McGowh, Tower Bldg., 1503 Union St., Memphis, archt. CD 1/3.

O., **Bloomingburg**—GYMNASIUM—B. A. 8/26—W. J. Purcell, clk., Bd. Educ., Bloomingburg, gymnasium. Plans deposit $25. John Quincy Adams, 33-35 S. Champion Ave., Columbus, archt.

Tex., **Farmersville**—SCHOOL—B.A. 8/28—Bd. Educ., N. D. Wright, supt., Farmersville, elementary school. Tolbert & McFatten, 209 Flatiron Bldg., Fort Worth. CD 7/31.

▲ N. Y., **New York**—HOUSING—B.A. 8/29—New York City Housing Auth., 63 Park Row, Zone 7, (1) foundations and general construction, (2) heating and ventilating, (3) electric work and (4) plumbing for Sect. II, incl. bldgs. numbered 8 to 12 inclusive of Governor Alfred E. Smith Houses, Proj. NYS-25, in area bounded by Madison St., Catharine St., Oak St., James St., New Chambers St. and St. James Pl. Plans deposit $25. CD 4/19/46.

▲ N. Y., **New York**—HOSPITAL—B.A. 9/13—Dpt. P. Wks., Municipal Bldg., Zone 7, Contr. 1, general construction; Contr. 2, plumbing work; Contr. 3, heating, ventilating, air conditioning, refrigeration sys. and boiler plant; Contr. 4, electrical work and lighting fixtures, for constr. tuberculosis hospital, nurses house, laundry bldg., steward's building, garage and maintenance shops, staff quarters and superintendent's house, at Pelham Parkway South and Eastchester Rd. Plans deposit Contr. 1, $50; Contr. 2, 3 and 4, $25. CD 2/4/43.

LOW BIDDERS

Calif., **Hermosa Beach**—SCHOOLS—City School Dist., 1645 Hermosa Ave., rejected bids July 20, Valley Vista School and Prospect Ave. School, L.B. $368,000. CD 7/27.

Calif., **Yountville**—DOMICILIARY BARRACKS—State Div. Architecture, P. Wks. Bldg., Sacramento, July 25, general contract, 26,245 sq. ft. rein. con. women's domiciliary barracks, 12,076 ft. rein. con. women's employees quarters at Veterans Bldg., from Haas & Rothschild, 224 Brannan St., San Francisco. $488,000. CD 7/6.

Ky., **Owenton**—HIGH SCHOOL—Owen County Bd. Educ., Owenton, 1 story 8x100 ft. high school incl. 2 story 90x100 ft. auditorium addn., from Consolidated Constructors, 624 E. Woodbine St. and Reno Constr. Co., 1026 S. 3 St., Louisville. $292,927. CD 10/26/49.

▲ Mass., **Springfield**—HOUSING—City Housing Auth., July 29, 125 units veterans housing Proj. 200-3, Bay St. and Berkshire Ave., from Beverly Constr. Co., 142 Hancock St. $1,545,454. CD 7/14.

N. Y., **Napanoch**—POWER PLANT—Bureau Contracts & Accounts, Albany, July 26, general constr. power facilities at the Institute for Male Defective Delinquents, from Walter A. Stanley Constr. Co. Inc., R. R.

Ave., [illegible] $295,834 [illegible] Bros. Heating Corp., 4 Liberty St., Poughkeepsie, $315,600 [illegible]

N. C., Raleigh—PLANT, etc.—North Carolina Hospital [illegible] Raleigh [illegible] $71,560 [illegible]

N. D., Grand Forks—DORMITORY [illegible] University of North Dakota [illegible] Grand Forks, $306,700 [illegible]

Ore., Baker [illegible] $994,500 [illegible]

▲ S. C., Spartanburg [illegible] $1,514,962 [illegible]

Tex., Liberty [illegible] $306,136 [illegible]

CONTRACTS AWARDED

▲ Colo., Denver [illegible] $1,447,777 [illegible]

▲ Fla., Tampa [illegible] Tampa, $2,388,700 [illegible]

▲ Mass., Boston [illegible] $2,626,396 [illegible]

▲ N. Y., Brooklyn [illegible] New York, $2,268,628 [illegible]

▲ N. Y., Flushing [illegible] New York, Zone [illegible] $1,173,300 [illegible]

▲ N. Y., Poughkeepsie [illegible] New York, Zone [illegible] $1,489,000 [illegible]

Ore., Central Point [illegible] $412,932 [illegible]

Tenn., Stratford [illegible] $700,000 [illegible]

Tex., San Antonio [illegible] $287,248 [illegible]

COMMERCIAL BUILDINGS

BIDS ASKED

▲ Pa., Pittsburgh [illegible] $1,000,000 [illegible]

Ill., Chicago—RESTAURANT AND [illegible]

Pa., New Wilmington [illegible]

Tenn., Memphis [illegible]

Minn., Hopkins [illegible]

Wis., Green Bay [illegible]

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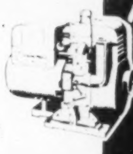

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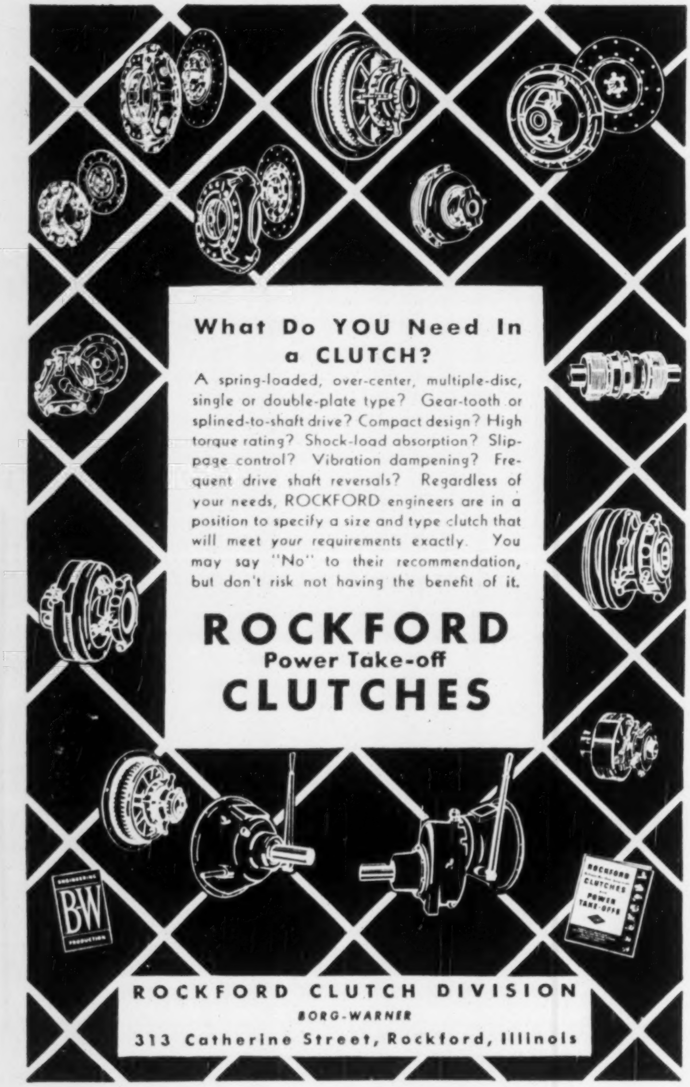

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[illegible] Schober, Barnes, Safford & [illegible], 310 Pine St., archts.

▲ Wis., Green Bay—SCHOOL, etc.—B.A. 8/22—Sts. Peter & Paul Catholic Congregation, Green Bay, 3 story bsmt., 64x203 ft., parochial school, 1 story, 69x128 ft. gymnasium and 3 story, bsmt. L-shaped, 53x71x43 ft. convent all rein. conc. steel, brick limestone. $1,000,000. Feldhausen & Coughlen & G. Feldhausen Jr., Green Bay, archts. CD 5/31.

Tex., Houston—CHURCH—Christ Episcopal Church, Texas Ave. at Fannin St., 2 story, gothic type, steel brick church, $500,000. Maurice J. Sullivan, 3901 Travis [illegible] St., archt.

LOW BIDDERS

Ark., Little Rock—EDUCATIONAL BLDG.—Immanuel Baptist Church, 10th and Bishop Sts., rejected bids July 25, erecting educational building—L. B. $44[illegible]. CD 7/7.

Mass., Arlington—HOSPITAL—Symmes Arlington Hospital, Summer St., July 19, remodel and renovate hospital, from George W. McCombey Co., 126 Newbury St., Boston, $269,770. Kendall, Taylor & Co., Inc., 221 Columbus Ave., Boston, archt.

Minn., Madison—HOME—Lutheran Ch. Peoples Home, Madison, rejected bids July 2[illegible], 3 story, ground floor, 35x146 ft., brick, stone [illegible] Peoples Home addn. $250,000. CD 7/7.

Mont., Billings—CLINIC—Billings Clinic, Hart-Albin Bldg., July 28, 2 story, bsmt., 73x109 ft., steel, brick, concrete, masonry medical clinic, from Riedesel Constr. Co., 2325 North Ave. N., $262,700. CD 7/14.

Tex., Houston—HOTEL—The Petroleum Club, Rice Hotel Roof, Houston, allowed bids to have been opened, remodeling roof garden into club, $750,000. Plans being redrawn. Staub & Rather, 2814 Virginia Ave., archts. CD 4/27.

CONTRACTS AWARDED

Calif., Barstown—DWELLINGS—Barstown Builders, 9238 W. Olympic St., Beverly Hills—66 frame, stucco dwellings, to Roy Conners & Co., 9238 Olympic Blvd., $495,127.

▲ † Calif., Hamilton Air Force Base—HOUSING—[illegible] Co., 561 Market, San Francisco, and Anderson-Rowe, Inc., 2561 Harrison St., both San Francisco, construct, manage and finance 500 unit housing project [illegible] 500 airmen units, 230 officers units, for Dept. Air Force, Pentagon Bldg., Wash., D. C., Owner bldrs. $5,000,000.

Calif., Santa Ana—DWELLINGS—[illegible] Development Co., 8754 Beverly Blvd., Los Angeles, 87 dwellings to Harvey Cherry Inc., 8754 Beverly Blvd., Los Angeles, $652,500. Roland Logan Russell, 1533 Fletcher Dr., Los Angeles, archts.

▲ Fla., Elgin Field—HOUSING—Dept. Air Force, Pentagon Bldg., Wash., D. C., construct, manage and finance 625 housing units, to F. W. [illegible], Inc., Pensacola, $5,000,000.

▲ Fla., Miami—STORE ADDN., etc.—Richards Department Store c/o Steward & Skinner, archts., [illegible] E. St., Miami, department store addn., alterations, to Fred Howland, Inc., 1453 N.W. 20 St., Miami, $1,000,000. Bids 2/26. CD 7/14.

▲ La., New Orleans—APARTMENT—[illegible] apartment to R. P. Farnsworth & Co., 1515 S. Salcedo, $1,250,000.

▲ Minn., St. Louis Park—SHOPPING CENTER—[illegible] shopping center at Wooddale Ave., Excelsior Ave. and Belt Line, to [illegible] Anderson, Inc., 501 South 8 St., Minneapolis, $1,000,000. M. D. [illegible], 141 S. Dearborn St., Chicago, Ill., archt.

▲ Minn., St. Paul—HOSPITAL—[illegible] Hospital, 125 [illegible] Ave. W., general contract, superstructure, [illegible] 52x181 ft. hospital, to [illegible] Constr. Co., 1371 Marshall Ave. Approx. $1,500,00. [illegible]

▲ Miss., Natchez—RESIDENCES—[illegible] residential development, to Dunne & Corley, Raleigh, N. C. $1,000,000. CD 12/23.

N. C., Greensboro—OFFICE ADDN., etc.—Pilot Life Insurance Co., [illegible] 3 story 50x129 ft. [illegible] office addn. and alterations.

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[illegible] to Southeastern Constr. Co. [illegible] W. 2 St., Charlotte. $750,000. Bids 7 14, awarded 7 27. CD 6/22.

▲ O., Akron—HOMES—[illegible] Arlington St. [illegible] Sand Run Rd. [illegible] Fairlawn Golf Course. [illegible] Approx. $1,600,000.

O., Cleveland—HOMES—[illegible] 80 homes on Brookfield and [illegible] Aves. [illegible] $425,000.

O., Parma—HOMES—Progressive [illegible] Co., [illegible] Ave. [illegible] Heights, [illegible] $250,000.

O., Rocky River—HOMES—[illegible] $260,000.

▲ Okla., Oklahoma City—BUILDING ADDN—Liberty National Bank, [illegible] W. Main St., Zone [illegible] Apco Tower Building [illegible] to Manhattan Constr. Co., First Natl. Bldg., Approx. $1,500,000. [illegible]

▲ Tex., Fort Worth—OFFICE—[illegible] 12 story [illegible] & Sweeney [illegible] Approx. $2,225,000. CD [illegible]

▲ Tex., Fort Worth—DWELLINGS—[illegible] Commerce St. [illegible] Thomas [illegible] Constr. Co., [illegible] Dallas. Approx. $1,575,000. CD 7/24.

▲ Alaska, Whittier—APARTMENT—[illegible] Westlake Ave., Seattle, Wash. [illegible] $1,000,000. [illegible] Los Angeles, Calif. [illegible]

Tex., Houston—DWELLINGS—[illegible] 25 dwellings [illegible] $875,000. CD 5/24.

Tex., Houston—DWELLINGS—Reed & Yancey Constr. Co., [illegible] Richmond Rd., 100 dwellings. Proj. 1, Unit 2, [illegible] $725,000. CD 5/24.

Tex., Lubbock—DWELLINGS—[illegible] Development Corp. [illegible] Lubbock, 100 [illegible] dwellings, [illegible] $600,000. CD 7/27.

INDUSTRIAL BUILDINGS

BIDS ASKED

Kan., Cedar Vale—PLANT—B.A. [illegible] 14 [illegible] Cooperative [illegible] Cedar Vale [illegible] & Assoc. [illegible] CD 6/16.

Ill., Skokie—SHOP, etc.—B.A. [illegible] Steel [illegible] W. Washington St. [illegible] concrete brick shop and warehouse. [illegible] Michigan Ave., Chicago, Zone 11. [illegible]

▲ Tex., Altair—PLANT—B.A. [illegible] & Gas Bldg., Houston, [illegible] $1,500,000. [illegible]

Ariz., Flagstaff—COMPRESSOR STATION—B.A. Asked—El Paso Natural Gas Co., [illegible] El Paso, Tex. [illegible] gas compressor station. $373,600.

Que., Montreal—FACTORY ADDN.—B.A. Asked—[illegible] Thompson, archt., 1281 Guy St., Montreal, concrete, structural steel, brick factory addn. for [illegible] Products Co. [illegible] Montreal. CD [illegible]

CONTRACTS AWARDED

Calif., Los Angeles—GARAGE, STORAGE—[illegible] Center, 3721 W. [illegible] $450,000. [illegible]

Calif., Santa Clara—PLANT ADDN.—Permanente Cement [illegible] Santa Clara [illegible] $732,000.

Fla., Miami—GARAGE—[illegible] & [illegible] $118,000. Bids 7/12. CD. 7/14.

Ga., Atlanta—FACTORY ALTERATIONS—[illegible] factory alterations [illegible] Whitehead Bldg., Atlanta. Approx. $100,000.

Ga., Atlanta—PLANT—[illegible] 2 mfg. bldgs. Owner builds. $75,000.

Ill., Chicago—FACTORY—[illegible] Corp. [illegible] St., Zone 14, 2 story [illegible] brick [illegible] factory [illegible] $300,000. [illegible] Awarded 7/24.

Ky., Louisville—PLANT—[illegible] & Chestnut St., Zone [illegible] $70,000. Awarded 7/11.

Md., Baltimore—FACTORY—[illegible] & [illegible] $154,000. [illegible]

▲ N. C., Acme—PLANT—Riegel Paper Corp. [illegible] S. Main St., Greenville, S. C. [illegible] & Sons [illegible] $13,500,000. CD 5/1/48.

Ore., Sherwood—PLANT ADDN.—[illegible] Co., [illegible] Constr. Co. [illegible] Pine St., Portland. $100,000. Awarded 7/26.

Wis., Green Bay—PLANT, WAREHOUSE—[illegible] Co., Green Bay, [illegible] & Zeise Constr. Co., 1017 N. Jackson St., Green Bay. $157,400.

Wis., Milwaukee—GARAGE—[illegible] Ave., Zone 2, 1 story [illegible] Ave., Zone 9. Bids 7/25. CD 7/28.

Ont., Hamilton—PLANT ADDN, etc.—[illegible] $150,000. [illegible]

Ont., Toronto—PLANT—[illegible] Approx. $260,000. [illegible]

Que., Montreal—FACTORY ADDN.—[illegible] $175,000. [illegible]

UNCLASSIFIED

BIDS ASKED

N. Y., New York—PIER—B.A. [illegible] Battery Pl., Manhattan, Zone 4 [illegible] Plans deposit $5. CD 7/13.

N. J., Port Newark—RAILROAD TRACK—B.A. 8 16—Port of New York Auth., 111 8 Ave., New York 11, N. Y. [illegible] PN-12. Plans deposit $10.

Ont., Turkey Point—WHARF—B.A. [illegible] $10. [illegible] Ottawa. [illegible]

† Colorado—TRANSFORMERS, etc.—B.A. 8 17—Bureau of Reclamation [illegible] Denver [illegible] Extended date. CD 6/22.

† North Dakota—DISTRIBUTION BOARDS, etc.—B.A. [illegible] Extended date. CD 7/27.

Oregon—DAM, etc.—B.A. [illegible] Portland [illegible] $10. [illegible] Portland, Ore.

Tenn., Fayetteville—GAS SYSTEM—B.A. 8 21—Fayetteville Gas System Bd. [illegible] Birmingham, Ala. [illegible] Extended date. CD 7/13.

Nebraska—RURAL DISTRIBUTION LINES—B.A. [illegible] $423 [illegible] CD 12/29.

N. Y., Great Kills—WATERFRONT—[illegible] New York [illegible] Plans deposit $25 each. CD [illegible]

California—[illegible] SYSTEM, etc.—B.A. [illegible] Agriculture [illegible]

Nebraska—RURAL DISTRIBUTION LINES—B.A. 8 [illegible] Custer County RP Dist., Broken Bow [illegible] Reed & Co., Columbus, engrs. CD 6/[illegible]

Nebraska—RURAL DISTRIBUTION LINES—B.A. 8/24—Dawson County RP Dist., Lexington [illegible] Reed & Co., Columbus, engrs. CD [illegible]

† N. Y., Schenectady—INSULATION [illegible]—B.A. 8 24—[illegible] Knolls Atomic Power Laboratory. $110,000.

† Tennessee—[illegible] B.A. [illegible]

Ala., Mobile—CONVEYOR SYSTEM—B.A. [illegible] State Docks & Terminals [illegible] Extended date. CD 7/27.

Pa., Philadelphia—PIER SUPERSTRUCTURE—B.A. 8 29—National Sugar Refining Co., 129 Front St., New York, N. Y., superstructure for Piers 44 and 45.

Missouri—MECHANICAL WORK—B.A. 8 31—Northeast Missouri Electric Power Cooperative, Palmyra, [illegible] CD 12/22.

Wis., Fond du Lac—GRANDSTAND—B.A. [illegible] Plans deposit $10. [illegible] S. Main St., [illegible]

Texas—RURAL DISTRIBUTION LINES—B.A. [illegible]

Texas—[illegible] B.A. Asked [illegible]

LOW BIDDERS

Ala., Demopolis—GAS SYSTEM—[illegible] Birmingham. $423,461. CD 7/13.

Calif., Marysville—EXHIBIT BLDG.—[illegible] Norman Peterson [illegible] $108,750. CD 7/13. [illegible]

† Idaho, Arco—TRANSFORMERS, etc.—U. S. Atomic Energy Comm., Idaho Operations Office, Idaho Falls [illegible] S. Temple St., Salt Lake City, Utah. $300,306.

† N. M., Las Cruces—ROCKET FUEL STORAGE—[illegible] Albuquerque [illegible] Robert E. McKee, Inc. P. O. Box 651, Albuquerque. $104,633. Est. $100,000. CD 7/18.

† N. Y., Albany—[illegible] New York, Zone 13 [illegible] Hospital [illegible] CD 6/22.

North Dakota—RURAL DISTRIBUTION LINES—[illegible] Cooperative, New England, July 19 [illegible] Adams and Hettinger Counties [illegible] $390,739. CD 7/12.

Tex., Kingsville—STADIUM—Texas College of Arts & Industries, Kingsville, July 28, stadium [illegible] $202,600. Est. $[illegible] CD 7/17.

CONTRACTS AWARDED

Ga., Valdosta—MOTOR [illegible] to J. N. [illegible] Valdosta. Approx. $75,000.

Missouri—RURAL DISTRIBUTION LINES—[illegible] $377,733. CD [illegible]

North Carolina—RURAL DISTRIBUTION LINES—[illegible] Hillsboro [illegible] N. C. [illegible] $88,554. [illegible]

Oregon—[illegible] Oregon [illegible] Portland [illegible] $55,272. Awarded 7/26. [illegible]

Tex., San Antonio—[illegible] City Public Service Bd. [illegible] N. St. Marys St. [illegible] $50,000 and $100,000 [illegible]

Tex., San Antonio—STREET LIGHTING—City Public Service Bd., 203 N. St. Marys St. street lighting [illegible] $100,000.

Wash., Bellingham—SWIMMING POOL ADDN.—[illegible] & Holly Sts. [illegible] $174,075. [illegible]

Wash., Spokane—[illegible] TOWER—[illegible] International Derrick & Equipment Co., 2410 [illegible] St., Torrance, Calif. $93,253.

Ont., Goderich—HARBOR REPAIRS—Dept. of Public Works [illegible] Ottawa [illegible] Bldg., Toronto. $172,752. [illegible] CD 7/17.

Ont., Port Arthur—[illegible] $105,500. [illegible]

Proposal Advertisements see pp. 88-95

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

Bids: September 18, 1950 (926)

Sanitary Sewerage System

EWING-LAWRENCE SEWERAGE AUTHORITY

Sealed bids will be received by the Ewing-Lawrence Sewerage Authority, 156 State Street, Trenton, New Jersey, until 2 o'clock P.M. September 18, 1950 at the Lawrence Township Hall for construction of a sanitary sewerage system in Ewing and Lawrence Townships, Mercer County, New Jersey.

The work to be done includes furnishing the materials and performing the labor for constructing approximately 2,000 feet of 36 inch, 1,400 feet of 33 inch, 7,500 feet of 30 inch, 20,600 feet of 27 inch, 1,800 feet of 21 inch, 3,500 feet of 18 inch, 3,300 feet of 15 inch, 15,000 feet of 12 inch, 10,700 feet of 10 inch and 250,000 feet of 8 inch gravity sewers, 5,500 feet of 6 inch pressure sewers and 43,100 feet of 6 inch house connections. The work is divided into five sections under which it is classified according to its character and location. Bidders will be allowed to bid on one or more sections or on a combination of sections.

Copies of the plans and specifications may be examined and obtained at the office of the Authority or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, N. Y. upon deposit of Fifty Dollars, which will be refunded upon return of the plans and specifications in good condition within 20 days after the date on which bids are received.

Each proposal must be accompanied by a certified check or bid bond from a surety company authorized to do business in New Jersey and satisfactory to the Authority in amount equal to ten percent of the proposal, and by an agreement in writing from a qualified surety company binding the surety to execute the required performance bond in the event the bidder is awarded the contract.

The Authority reserves the right to consider bids for 30 days after their receipt before awarding any contract and to accept any bid or reject any or all of them.

EWING-LAWRENCE SEWERAGE
AUTHORITY
By WILFRED F. [illegible]
Secretary.

Bids: August 30, 1950 (925)

Construction of Harbor Project

The Puerto Rico Transportation Authority will receive sealed bids for the construction of Arecibo Harbor Project, Bulkhead Wharf, until 2:00 P.M. (Puerto Rico Time) on the 30th of August of 1950, at San Juan, Puerto Rico, at which time and place all bids will be publicly opened and read aloud.

The successful bidder will be required to furnish satisfactory performance and payment bond or bonds.

Proposal forms and contract documents, including plans and specifications, are on file in the office of the Chief Engineer of the Puerto Rico Transportation Authority, at San Juan, Puerto Rico.

Copies of the documents may be obtained until 48 hours prior to scheduled time for opening the bids, by depositing $25.00 with the Puerto Rico Transportation Authority for each set of documents so obtained. The amount of the deposit will be refunded to each person who returns the plans and documents in good condition within 10 days after the opening of the bids.

The Puerto Rico Transportation Authority reserves the right to reject any or all bids and waive any informalities in bidding.

A certified check or bank draft payable to the Puerto Rico Transportation Authority, U. S. Government Bonds, or a satisfactory bid bond executed by the bidder and acceptable sureties in an amount equal to five percent of the bid shall be submitted with each bid.

SALVADOR V. [illegible]
General Manager

Bids: August 29, 1950 (924)

Port Jervis Sewerage System

PLUMBING, GAS FITTING, HEATING
AND VENTILATING EQUIPMENT
CONTRACTS 424 and 425

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday, August 29, 1950, for Contracts 424 and 425, for furnishing, delivering, installing and testing plumbing, gas fitting, heating and ventilating equipment for the sewage treatment plant and pumping stations of the Port Jervis sewerage system, in the City of Port Jervis, Orange County, New York, all as set forth in the specifications. Contract 424 will comprise plumbing equipment for the North Street and Neversink pumping stations and plumbing and gas fitting equipment for the sewage treatment plant; Contract 425 will comprise heating and ventilating equipment for the two pumping stations and the sewage treatment plant.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to sureties, etc., of each contract can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of $5.00 in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President; RUFUS E. McGAHEN, JAMES J. MORAN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary

Bids: August 31, 1950 (911)

Substructure & Superstructure

DELAWARE RIVER
JOINT TOLL BRIDGE COMMISSION

526 Broad Street Bank Building
Trenton 8, New Jersey
NOTICE TO CONTRACTORS

Sealed proposals for the construction of the Delaware River Bridge from Morrisville, Pennsylvania to Trenton, New Jersey will be received by the Delaware River Joint Toll Bridge Commission at its office, 526 Broad Street Bank Building, Trenton 8, New Jersey, until eleven o'clock (11:00) A.M., Eastern Standard Time, on the 31st day of August 1950, at which time and place all bids will be publicly opened and read aloud.

After Monday, July 31, 1950, Instructions to Bidders, form of Proposal, form of Contract, form of Performance Bond, Plans and Specifications may be examined at the office of the Commission, above address, or at the office of the J. E. Greiner Company, 1201 St. Paul Street, Baltimore 2, Maryland and copies thereof obtained upon payment of $[illegible] for each set, which amount is not returnable.

The following are approximate quantities of major items:

Substructure	
Wet and Dry Excavation	11,000 C.Y.
Rock Excavation	1,000 C.Y.
Concrete	11,000 C.Y.
Reinforcing Steel	[illegible] Lb.
Granite Facing	1,000 C.Y.
Superstructure	
Structural Steel	2,[illegible] Tons
Concrete	[illegible] C.Y.
Reinforcing Steel	150,000 Lbs.

Bids for the bridge may be submitted for substructure and superstructure separately or as a combined bid.

Each bid must be accompanied by a certified check in the amount of five percent (5%) of the total bid price.

A [illegible] shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been Awarded the contract, to enter into a written contract with the Commission in accordance with the accepted bid, and to give a Performance Bond satisfactory to the Commission, equal to one hundred percent (100%) of total amount of contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids; and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER
TOLL BRIDGE COMMISSION,
By: Alexander R. Miller
Chairman of Commission
Date July 31, 1950

Bids: August 24, 1950 (913)

Pumping Units & Switchgear Units

Sealed proposals will be received by the Burlington Municipal Waterworks at the office of the City Clerk at the City Hall, in Burlington, Iowa, until 10 A.M. (Central Standard Time) on the 24th day of August, 1950, up to the hour of opening bids, at which time and place all bids will be publicly opened and read aloud. Bids will be received on contracts designated as A and B as follows:

Contract A—Furnishing two (2) electric and gasoline engine dual driven centrifugal pumping units and five (5) electric driven centrifugal pumping units.

Contract B—Furnishing seven (7) enclosed type switchgear units for the above pump motors and one bus sectionalizing unit.

Each bid must be accompanied by a certified check in an amount equal to 10% of the amount of the bid made payable to the Burlington Municipal Waterworks.

Each successful bidder will be required to furnish a satisfactory Performance Bond in an amount equal to 100% of his contract. The contract form is attached herewith.

The right is reserved to reject any or all bids, to waive any informalities in bidding or to accept any considered advantage to the Burlington Municipal Waterworks.

No bid may be withdrawn after the scheduled closing time for the receipt of bids but may be withdrawn prior to the closing time.

Specifications may be obtained at the office of the Burlington Municipal Waterworks, 214 North Fourth Street, or at the office of Alvord, Burdick and Howson at 20 North Wacker Drive, Chicago, Illinois.

BURLINGTON MUNICIPAL
WATERWORKS
M. E. [illegible]
Superintendent
ALVORD, BURDICK & HOWSON
ENGINEERS CHICAGO

(Continued on page 89)

CONTRACTORS

Watch this Section

for New Projects

Publish your announcement thru the "Proposals Section" of Engineering News-Record and get their bids.

U. S. Government

(Continued from page 88)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 3149) will be received by Bureau of Reclamation, Friant, California, August 31, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and concrete lining, Station 1626 to Station 1945, Friant-Kern Canal, Central Valley Project, California. The work is situated approximately 18 miles east of Fresno, California. Principal items are approximately [illegible] cu. yds. excavation, 3,457 cu. yds. reinforced concrete canal lining, and other work. Time allowed for completion will be 420 days. For particulars, address Bureau of Reclamation, Friant, California, or Building 11, Denver Federal Center, Denver, Colorado. MICHAEL W. STRAUS, Commissioner. (9211)

Department of Commerce, Bureau of Public Roads, July 31, 1950. SEALED BIDS will be received at the office of the Bureau of Public Roads, First National Bank Building, Florence, Alabama, until 10:00 a.m., C.S.T., September 1, 1950 for the construction of Project 3G1, Natchez Trace Parkway, Wayne, Lawrence and Lewis Counties, Tennessee. Length 7.731 miles. The approximate quantities of the more important items are as follows: [illegible] cu. yd. Excavation, 55,000 tons Crushed Gravel or Crushed Stone Base Course, 960 cu. yd. Cement Concrete and 7,000 sq. yd. [illegible] and Placing Sod. Minimum wage rates have been fixed as required by law. For plans and specifications a deposit of $10.00 cash or CERTIFIED check made payable to the Treasurer of the United States will be required to insure their return within 15 days after the opening of bids. Plans, Specifications and proposal forms may be obtained from the Bureau of Public Roads offices, First National Bank Building, Florence, Alabama, or 1110 Columbia Pike, Arlington, Virginia. H. J. Spelman, District Engineer. (9225)

OFFICIAL PROPOSALS

Bids August 14, 1950 (9122)

Furnishing and Delivering Standard Manhole Frames & Covers, Manhole Steps, Light Weight Manhole Frames & Covers

WASHINGTON SUBURBAN SANITARY COMMISSION

Sealed proposals for furnishing and delivering four hundred (400) Standard Manhole Frames & Covers marked "S", one hundred (100) Standard Manhole Frames & Covers marked "W", three thousand (3000) Manhole Steps and fifty (50) Light Weight Manhole Frames & Covers marked "W" will be received in the office of the Purchasing Agent, Room 3 of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland, until 10:30 A.M., Monday, August 14th, 1950.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight R. Galt, Chairman
Warren Browning
Leland G. Worthington
Commissioners

Bids September 13, 1950 (9161)

Water Supply Improvements Pumping Station

CITY OF NIAGARA FALLS
NEW YORK

Sealed proposals will be received by the City Manager of Niagara Falls, New York at the office in said City not later than 10:00 A.M. Eastern Daylight Saving Time on September 13, 1950, at which place and time they will be publicly opened and read, and contracts awarded as soon thereafter as practical, for the construction of a water pumping station located south of Buffalo Avenue at 53rd Street, in the City of Niagara Falls.

The work is divided into four Divisions. Each bidder may submit a proposal for any Division, or all Divisions or for any combination of Divisions.

Division 2, Structures, comprises the construction of a water pumping station with reinforced concrete substructure and structural steel and brick superstructure, and all piping and miscellaneous equipment, and including a separate transformer yard and electrical equipment building.

Division 3, Pumping Equipment, comprises the furnishing, installing, and testing of six high lift pumping units varying in capacity from 15 to 25 MGD at 265 feet head, and four low lift pumping units varying in capacity from 15 to 30 MGD at 30 feet head, with certain appurtenant equipment. The pumps are to be of the vertical shaft type, with close-coupled electric motor drives.

Division 4, Electrical Equipment, comprises the furnishing, installing and testing of the [illegible] switchgear and control panel for the pumping station.

Division 5, Electrical Work, comprises the furnishing and installing of wiring, conduits, and all electrical equipment not included under Division 4.

All work shall be in accordance with Instructions to Bidders, Proposal, Advertisement, Specifications, Contract, Performance Bond and Plans on file at the office of the City Engineer, City Hall, Niagara Falls, New York, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained from the City Engineer or Greeley and Hansen upon the deposit of $[illegible] for each set. The amount of the deposit will be refunded to each bidder who returns the Contract Documents within 30 days after the opening of bids.

A bank draft or certified check in the amount of not less than five per cent of the total of the bid, made payable at sight to the City Manager, Niagara Falls, New York, must accompany each proposal.

The Contractor shall furnish a performance bond approved by the Corporation Counsel in the amount of [illegible] per cent of the contract price.

The City reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to its interest, after all bids have been examined and canvassed.

CITY OF NIAGARA FALLS
(Signed) Charles W. [illegible]
Acting City Manager
Dated August 14, 1950

Bids August 23, 1950 (9151)

State Road Work

Sealed proposals will be received by the State Highway Department at its offices in Dover, Delaware, until 2:00 P. M. E.D.S.T. (1:00 P. M. E.S.T.) August 23, 1950, and at that time and place publicly opened for contracts involving the following approximate quantities:

CONTRACT 886
Federal Aid Project F-137
PHILADELPHIA PIKE
23rd Street to Bellevue Road
New Castle County
C. C. Widening & Hot-Mix Asphalt Surface 2.721 miles

12,500	C. Y. Excavation
[illegible]	C. Y. Rock Excavation
10	C. Y. Structure Excavation
[illegible]	C. Y. Borrow Pit Stripping
10	T. W. B. Macadam
4,500	C. Y. Cement Concrete Base
19,000	T. Hot Mix Asphalt Surface
4,000	S. Y. Patching
[illegible]	C. Y. [illegible] Masonry
1,250	Lbs. Reinforcing Steel
[illegible]	Lbs. Structural Steel
55	C. Y. Cement Rubble Masonry
[illegible]	L. F. 12" R. C. Pipe
111	L. F. 15" R. C. Pipe
[illegible]	L. F. 18" R. C. Pipe
24	L. F. 24" R. C. Pipe
101	L. F. 30" R. C. Pipe
[illegible]	L. F. 12" [illegible] Pipe
[illegible]	L. F. [illegible] Timber [illegible]
[illegible]	L. F. Cement Concrete Curb
61,500	S. F. 4" Cement Concrete Sidewalk
8,000	S. F. 6" Cement Concrete Sidewalk
18	Each Catch Basins, Type "A"
[illegible]	Each Catch Basins, Type "C"
51	Each Adjusted Catch Basins
8	Each Manholes
[illegible]	Each Adjusted Manholes
[illegible]	Lbs. Castings
7,000	S. Y. Topsoil
1.5	A. Seeding
[illegible]	S. Y. Sodding
[illegible]	L. F. Conc. Inlet Pipe
100	T. Sand
[illegible]	T. [illegible] Screenings
[illegible]	S. Y. Remove Present Pavement
10	T. Calcium Chloride
[illegible]	Each [illegible]
[illegible]	L. F. Steel Handrail
1,200	C. Y. Pit Run Material

CONTRACT 1030
Federal Aid Project S-F-172 [illegible]
KENTON TO PLEASANTON'S GARAGE
Kent County
Hot-Mix Asphalt Resurface
6.176 Miles

1,656	C. Y. Excavation
9,200	C. Y. Borrow
200	C. Y. Borrow Pit Stripping
11,200	C. Y. Selected Borrow
80	T. Waterbound Macadam
14,000	T. Hot Mix Asphalt Surface
[illegible]	C. Y. Cement Concrete Pavement
2,200	S. Y. Patching
25	C. Y. Cement Concrete Masonry
750	Lbs. Reinforcing Steel
1,120	L. F. 12" R. C. Pipe
412	L. F. 15" R. C. Pipe
116	L. F. 18" R. C. Pipe
60	L. F. 24" R. C. Pipe
34	L. F. 42" R. C. Pipe
240	L. F. 8" C. M. Pipe
1,600	L. F. Wood Shoulder Curb
8	Each Catch Basin, Type "B"
1,500	Lbs. Castings
2	Each Manholes
1,600	L. F. Wire Rope Guard Fence
36	Each End Post Attachment
2,000	S. Y. Sodding
[illegible]	Gal. R. C. [illegible] Asphalt
[illegible]	Gal. R. C. [illegible] Asphalt
15	T. Stone Chips
15	T. Crushed Chips
1,700	S. Y. Remove Present Pavement
[illegible]	T. Sand
2,000	L. F. [illegible]

These contracts are Federal Aid Projects and will be governed by the provisions of the Federal Aid Highway Act as amended.

The Employment Agency for these contracts shall be the Delaware State Employment Service whose offices are located at 601 Shipley Street, Wilmington, Delaware and [illegible] S. State Street, Dover, Delaware.

Attention is called to the Special Provisions in the proposals, specifications and contract agreement.

Performance of contract shall commence within ten (10) days after the execution of the contract and be completed as specified.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check or money in the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked "Proposal for the construction of State Highway Contract No. [illegible]"

The right is reserved to reject any or all bids.

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

Complete sets of plans and specifications may be obtained after August 7, 1950 upon receipt of [illegible] dollars ($5.00) for each contract, which amount will not be refunded.

Make checks payable to the State Highway Department.

STATE HIGHWAY DEPARTMENT
By J. Gordon Smith, Chairman
M. Allen Wilson, Chief Engineer
Dover, Delaware
July 26, 1950

Bids August 24, 1950 (9143)

Water Tank

Sealed proposals will be received by the Burlington Municipal Waterworks at the office of the City Clerk at the City Hall in Burlington, Iowa, until 10 A.M. (Central Standard Time) on the 24th day of August, 1950, this to be the hour of opening bids, at which time and place all bids will be publicly opened and read aloud. Bids will be received on contracts designated as A and B as follows:

[illegible] gallon steel elevated watertank.

Each bid must be accompanied by a certified check in an amount equal to 10% of the amount of the bid made payable to the Burlington Municipal Waterworks.

The successful bidder will be required to furnish a satisfactory Performance Bond in the amount of 100% of his contract. The contract form is attached herewith.

The right is reserved to reject any or all bids, to waive any informalities in bidding or to accept any considered advantageous to the Burlington Municipal Waterworks.

No bid may be withdrawn after the scheduled closing time for the receipt of bids, but may be withdrawn prior to the closing time.

Specifications may be obtained at the office of the Burlington Municipal Waterworks, 211 North Fourth Street, or at the office of Alvord, Burdick & Howson at 20 North Wacker Drive, Chicago, Illinois.

BURLINGTON MUNICIPAL WATERWORKS
M. [illegible]
Superintendent
ALVORD, BURDICK & HOWSON
ENGINEERS CHICAGO

(Continued on page 90)

OFFICIAL PROPOSALS

(Continued from page 89)

COMMONWEALTH OF VIRGINIA DEPARTMENT OF HIGHWAYS RICHMOND VIRGINIA Sealed Bids will be received at the Department of Highways [illegible]

State Road Work

[illegible]

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Sanitary Sewer & Sewage Pumping Stations

[illegible]

OFFICIAL PROPOSALS

[illegible]

Construction of Taxiway

[illegible]

Construction of Water Distribution System

[illegible]

OFFICIAL PROPOSALS

Bids: September 19, 1950 (877)

Construction of Sewage Collection and Treatment Works

CITY OF SAGINAW, MICHIGAN
BIDS: SEPTEMBER 19, 1950

[illegible]

DIVISION A—COLLECTING AND INTERCEPTING SEWERS

[illegible]

DIVISION D—SLUDGE AND GARBAGE INCINERATOR

[illegible]

ROY A. BENWAY
Purchasing Officer

(Continued on page 91)

7 U. S. Government
(Continued from page 90)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. [illegible]) will be received by Bureau of Reclamation, Redding, California, August 29, 1950, and then publicly opened for furnishing labor and materials and performing all work for dismantling and removing existing bridge and the construction of earthwork, foundations, and superstructure for new Sacramento River bridge, Shasta Dam, Central Valley Project, California. The work is situated north of Redding, California, near Shasta Dam. Principal items are approximately: dismantling and removing existing bridge, excavation 12,000 cu. yds., concrete 2,100 cu. yds., [illegible] and other work. Time allowed for completion will be 400 days. For particulars, address Bureau of Reclamation, Redding, California, or Building [illegible], Denver Federal Center, Denver, Colorado.
MICHAEL W. STRAUS, Commissioner.
[illegible]

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. [illegible]) will be received by Bureau of Reclamation, Coulee Dam, Washington, August [illegible], 1950, and then publicly opened, for furnishing labor and materials and performing all work [illegible] Coulee Dam, Washington [illegible] Bureau of Reclamation, Coulee Dam, Washington, or Building [illegible], Denver Federal Center, Denver, Colorado.
MICHAEL W. STRAUS, Commissioner.
[illegible]

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. [illegible]) will be received by Bureau of Reclamation, [illegible], Utah, August [illegible], 1950, and then publicly opened [illegible] Building [illegible], Denver Federal Center, Denver, Colorado.
MICHAEL W. STRAUS, Commissioner.
(9920)

Department of Commerce, Bureau of Public Roads. [illegible] SEALED BIDS will be received at the office of the District [illegible] Public Roads, P.O. Box [illegible], Hot Springs, Arkansas, until [illegible] August [illegible], 1950, for the construction of [illegible] Forest Highway Project No. [illegible], Part 1, [illegible] and Newton Counties, Arkansas. Length 2.3 miles. [illegible] Minimum wage rates [illegible] as required by law. For plans and specifications a deposit of [illegible] CERTIFIED CHECK made payable to the Treasurer of the United States will be required [illegible] within 15 days after opening of bids. [illegible] Bureau of Public Roads, [illegible] Arlington, Virginia. H. E. [illegible], Division Engineer.
[illegible]

READ THE OFFICIAL
PROPOSAL COLUMNS OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

Bids: August [illegible], 1950 [illegible]

State Road Work

NOTICE TO CONTRACTORS. STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y. Pursuant to the provisions of the Highway Law and special provisions for projects financed with Federal aid funds, sealed proposals will be received until [illegible] A.M. [illegible] standard time, which is [illegible] A.M. [illegible] standard time, on Wednesday, August [illegible], 1950 by [illegible] Bureau of Contracts & Accounts, [illegible] Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A [illegible] will be made in full to bidders for the return of plans [illegible] in good condition within 30 days of award or rejection of bids. [illegible] for all other sets in good condition [illegible] will be [illegible] of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1						
		[illegible] Dist. Engr. [illegible] Albany, N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	Weatherproofing Pavt.	$[illegible] Plus $[illegible]	$11,000
DISTRICT No. 2						
		[illegible] Dist. Engr. [illegible] N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	Weatherproofing Pavt.	$[illegible] Plus $[illegible]	$11,000
DISTRICT No. 3						
		[illegible] Dist. Engr. [illegible] N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	Weatherproofing Pavt.	$[illegible] Plus $[illegible]	$11,000
DISTRICT No. 4						
		A. E. [illegible] Dist. Engr. [illegible] Rochester, N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	Weatherproofing Pavt.	$[illegible] Plus $[illegible]	$17,000
DISTRICT No. 5						
		[illegible] Dist. Engr. [illegible] N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	[illegible]	$[illegible] Plus $[illegible]	$2,500
DISTRICT No. 6						
		[illegible] Dist. Engr. [illegible] N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	Weatherproofing Pavt.	$[illegible] Plus $[illegible]	$[illegible]
DISTRICT No. 7						
		[illegible] Dist. Engr. [illegible] N. Y.				
[illegible]	RC 50-[illegible]	[illegible]	[illegible]	Weatherproofing Pavt.	$[illegible] Plus $[illegible]	$12,000
DISTRICT No. 8						
		[illegible] Dist. Engr. [illegible] N. Y.				
Oneida	FAEC 50-[illegible] FAC 50-[illegible]	[illegible]	[illegible]	[illegible]	$[illegible] Plus $50	$1,1[illegible],000
DISTRICT No. 9						
		C. E. [illegible] Dist. Engr. [illegible] Buffalo, N. Y.				
Erie	FAC 50-8	[illegible]	[illegible]	[illegible]	$[illegible] Plus $50	$2,2[illegible],000
DISTRICT No. [illegible]						
		[illegible] Dist. Engr. [illegible] N. Y.				
Cayuga	FA[illegible] 50-5	[illegible]	[illegible]	[illegible]	$[illegible] Plus $10	$[illegible]
DISTRICT No. [illegible]						
		[illegible] Dist. Engr. [illegible] N. Y.				
Ulster	RC 50-[illegible]	[illegible]	[illegible]	[illegible]	$1,[illegible] Plus $10	$[illegible]
DISTRICT No. 10						
		[illegible] Dist. Engr. [illegible] N. Y.				
Bronx	[illegible]	[illegible]	[illegible]	[illegible]	$[illegible] Plus $[illegible]	$[illegible]
Nassau	[illegible]	[illegible]	[illegible]	[illegible]	$[illegible] Plus $[illegible]	$[illegible]
Queens	[illegible]	[illegible]	[illegible]	[illegible]	$[illegible] Plus $[illegible]	$[illegible]
Suffolk	[illegible]	[illegible]	[illegible]	[illegible]	$[illegible] Plus $[illegible]	$[illegible]

Proposals for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly [illegible] on the outside of the envelope. Each proposal must be accompanied by [illegible] certified check payable to the order of [illegible] of the State of New York, Commissioner of Taxation & Finance, for the amount [illegible] in the above [illegible] of the Highway Law, as set forth in the [illegible].

[illegible] are permitted on contracts with Federal funds [illegible] as the [illegible] provided in the [illegible] the [illegible] is [illegible].

The right is reserved to reject any or all bids.

[illegible] TALLAMY
[illegible] OF PUBLIC WORKS

ESTIMATORS

Fully experienced in construction and capable of estimating building work, mechanical (machinery, equipment, piping, etc.) or electrical installations. Degree in civil, mechanical or electrical engineering preferred but not necessary.

Openings in Cleveland Office offers lengthy employment with good salary for those qualifying.

Send complete resume stating experience, education, salary requirements and available date to:

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Ferguson Building, 1783 East 11th Street
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Wanted — Experienced Construction Engineer for large turbo-generator power plant on East Coast. Must have recent experience in directing operations for complete project, with knowledge of sub-aqueous operations and construction of docks and waterfront facilities. Write giving full particulars of education, experience and salary expected.

P-7108, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

ESTIMATOR or COST ENGINEER

wanted for work in Brazil. Age 28 to 40. By North American Company which has been building hydro-electric projects in Brazil for past 50 years. First class engineering and construction organization with good opportunities for future. Salary to suit qualifications. In reply state experience and personal status in detail. Reply to

Dept. WHK
Canadian Brazilian Services, Ltd.
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WANTED:

Structural and Plate Steel Designer

Must have wide experience in both fields. Permanent position with moderate size plant in the Southwest. Write

P-7189, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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ARCHITECTURAL DESIGNER

Overseas assignment with an American oil company in South America. Must have degree and over five years' experience design and preparation of complete architectural drawings for new construction and alterations of small offices, industrial buildings, and residences. Must prepare isometrical and perspective drawings for presentation of architectural projects. This is a regular staff job, offering retirement plan and other benefits.

Write giving age, education, marital status and detailed experience resume.

Box 308-A
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Experienced ENGINEER, familiar with Oil Refinery design and capable of estimating process equipment from flow diagrams.

Give full information, experience record and salary expected.

ARTHUR G. McKEE & CO.
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An aggressive man capable of taking charge of a Sand, Gravel and Ready Mix Plant. An opportunity for the right man. Please give full details in your first letter as to age, availability and compensation. Address all replies in care

P-7185, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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WANTED by large company. Technical graduate, experienced in building & equipment installation. Chemical plant experience preferred. Man must be free to travel U. S. Give age, education, detailed experience, & salary expected.

Write
Box EN 1190, 221 W. 41 St., N. Y. C.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

DAM DESIGN and Construction Engineer, $[illegible]. [illegible] years responsible hydraulic experience including [illegible] in design or construction [illegible] phases of dams [illegible]. Applicants should be registered [illegible]. Apply on official forms [illegible] Sept. [illegible], 1950 [illegible] State Personnel Board, [illegible] Street, Sacramento, California.

MARYLAND STATE [illegible] Commission is seeking for a Planning Engineer I. This is a Merit system position [illegible] sick leave, annual salary increases and retirement benefits. Starting salary $[illegible]. Direct inquiries to the office of the State Employment Commission, [illegible] Street, Baltimore [illegible], Maryland, for complete information.

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CONSTRUCTION COMPANY [illegible] Engineering News-Record.

DESIGNING ENGINEER [illegible] Engineering News-Record.

WANTED: ESTIMATOR [illegible] Engineering News-Record.

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ENGINEER, [illegible], licensed in NY State. MS in CE, Univ. of Illinois. US citizen, single. [illegible] years experience design of light & heavy structures, [illegible] yrs in export field, desire [illegible] Near East. Available September. PW-[illegible], Engineering News-Record.

PROJECT ENGINEER Civil, Mechanical, Electrical Background. Age [illegible]. Design, Construction, Specifications, Estimating. Registered. Best References. PW-[illegible], Engineering News-Record.

GENERAL SUPERINTENDENT, [illegible], twenty-five years experience. Thoroughly experienced large scale multiple buildings, varied construction. Industrial and heavy construction. Graduate Engineer. Address PW-[illegible], Engineering News-Record.

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(Continued on the opposite page)

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(Continued from the opposite page)

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FS-7334, Engineering News-Record
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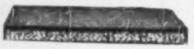

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14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
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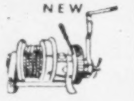

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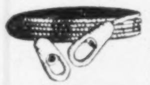

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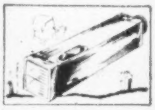

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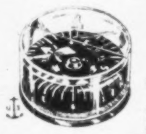

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LORAIN [illegible]

LORAIN [illegible]

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41-B, Bucyrus Erie, 50′ lattice type boom, steam powered.

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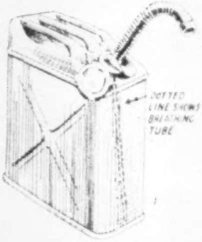
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CIVIL ENGINEERS, PLANNERS, AND SURVEYORS
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CARIBBEAN — WEST INDIES — SOUTH AMERICA
BERMUDA-CARIBBEAN CONSULTANTS, LTD.
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L. C. M[illegible], A. [illegible], C. W. [illegible], [illegible], H. J. Wright, [illegible], W. Weir

BOTH HEAD OFFICES AT HAMILTON, BERMUDA

Inspecting and Testing

Robert W. Hunt Co.

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Testing and Inspection of Construction Materials
[illegible] Avenue, New York [illegible], N. Y.
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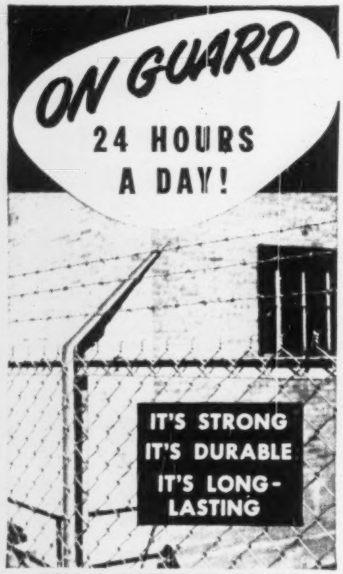
The Gulick-Henderson Laboratories, Inc.

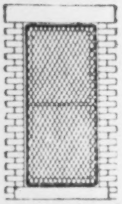
Inspecting & Testing Engineers

[illegible] Ave., Pittsburgh 19, Pa.
[illegible] West [illegible] St., New York [illegible], N. Y.
[illegible]



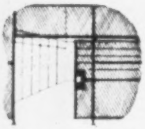
IT'S A STEWART FENCE

Notice the sturdy All-Beam framework . . . the extension arm and line post—an integral unit. Stewart Non-Climbable Chain Link Wire Fence, the heaviest and strongest manufactured, features a number of exclusive structural advantages you can't afford to overlook. Write for folder "Here's why you should buy a Stewart Chain Link Wire Fence."



WINDOW GUARD
(Wire or Iron)

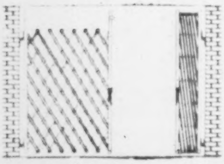
Made with round or channel frames to fit any size or shape opening. When requesting prices please give measurements and send diagrammatic sketch.



WIRE MESH
PARTITIONS—Sectional

Fit any height or width. Easily and quickly erected. When writing for prices please give all measurements involved.

STEEL FOLDING GATES



Made in single or double gate construction to fit any width opening. Prices on request. Please give width and height of opening.

THE STEWART IRON WORKS CO., INC.
1767 Stewart Block Cincinnati 1, Ohio

Stewart IRON and WIRE FENCES

NEW PRODUCTS

Batcher Has 12-Ft Capacity

BULK CEMENT BATCHER has sufficient capacity for a dual-drum paver—up to 12 ft per batch. Scales and controls on the Ferguson batcher are located for handy operation by one man. Cement from bulk supply (loaded directly, or delivered by truck) is dropped into bin where it is carried by chain-and-bucket elevator to the weighing hopper. Power is provided by a 16-hp engine. Batcher can be set up ready for work in 6 min. Unloading ramp of batcher forms gooseneck for attaching to fifth wheel of truck. Or, batcher can be towed behind an ordinary dump truck.—SHOVEL SUPPLY CO., 3900 HINES BLVD., DALLAS, TEX.

PASS ON RIGHT
DO NOT CROSS LINE

Traffic-Line Marker

Self-propelled traffic-line marker is recommended for high-speed highway work. It is truck-mounted, 2-man operated, and produces stripes from 3 to 8 in. wide, in solid or broken pattern. Adjustable bead dispenser is standard equipment. Paint guards control width of line and insure clean edges and uniform paint distribution. Overall width of machine is 5 ft 6 in. —THE GLEDHILL ROAD MACHINERY CO., GALION, OHIO.

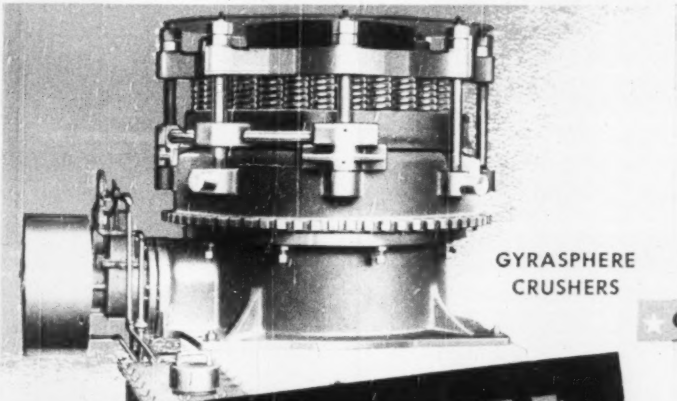
Gooseneck-Boom Trench Hoe

Attachment of P&H Model 255A excavator makes possible high-speed operation, increased digging depth, and maximum ruggedness. Operation of hoe is speeded by a 2-part hoist line. Power-operated auxiliary gantry raises and lowers the boom. The machine can cut vertical end at start of trench and can trim vertical walls. There is no flopping action due to special dipperstick linkage.—HARNISCHFEGER CORP., SMALL EXCAVATOR DIV., 4404 W. NATIONAL AVE., MILWAUKEE 14, WIS.

Lightweight Diesel Engine

Six-cylinder 2-cycle 275-hp diesel engine features compactness and light weight. The Model 110 (110 cu in. displacement per cylinder) embodies the same principles as GM's 71 Series. The 110 is offered as a Base engine with full equipment for marine or industrial use, or with special accessory

(Continued on page 105)



GYRASPHERE CRUSHERS

TELSMITH CRUSHERS

for

BETTER PRODUCT • BIGGER CAPACITY LOWER COST

What do you want to crush? What size product do you want to make? Coarse . . . intermediate . . . fine . . . or a wide range of sizes? Telsmith Crushers can do it for you most *dependably.* You can be sure that Telsmiths will be right for your particular job *always.* Because Telsmith builds crushers of *all types.* And Telsmith Engineers have no reason whatever to be prejudiced for or against any one type of crusher. Consult Telsmith Engineers . . . get their unbiased recommendations for your plant. Find out how the latest features in modern crusher design give you top tonnage, exceptional product quality, low cost . . . get 40-page Crusher Guide No. 271.

TELSMITH

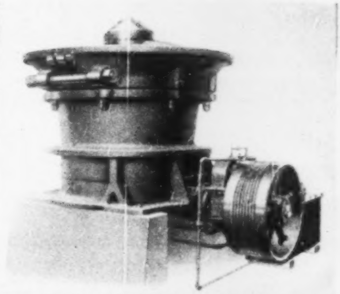
PRIMARY CRUSHERS

Jaw Crushers: Sizes 10 x 16 in. to 30 x 42 in., 22 to 240 tons per hr. capacity.

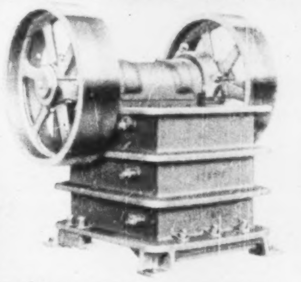
Gyratory Breakers: Sizes 6-B to 25-B, 26 to 400 tons per hr.

SECONDARY CRUSHERS

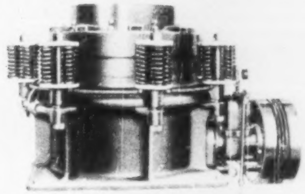
Gyrasphere: Sizes 24 to 48 in., 15 to 210 tons per hr. ***Intercone:*** Sizes 18 to 28 in., 26 to 68 tons per hr. ***Double Roll:*** Sizes 24 x 16 in. to 40 x 22 in., 75 to 132 tons per hr.



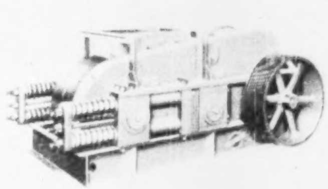
GYRATORY BREAKERS



JAW CRUSHERS



INTERCONE CRUSHERS



DOUBLE ROLL CRUSHERS

SMITH ENGINEERING WORKS, 500 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St.
New York 17, N.Y.

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Chicago 6, Ill.

713 Commercial Trust Bldg.
Philadelphia 2, Pa.

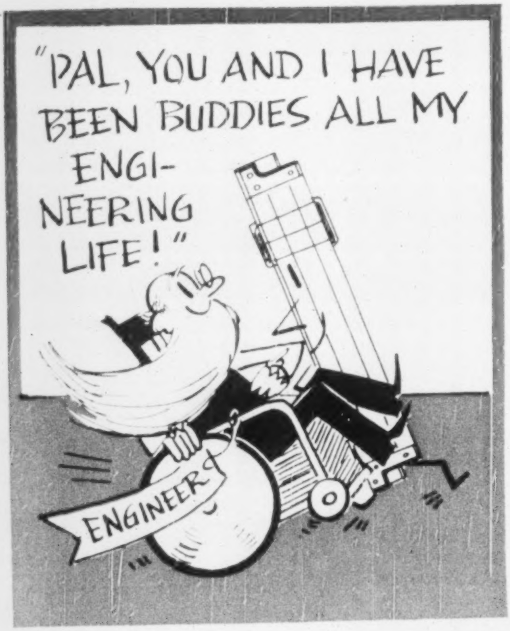
238 Main Street
Cambridge 42, Mass.

Boehck Eqpt. Co.
Milwaukee 3, Wis.

A. N. Wigle, 362 S. Ashburton Rd.
Columbus 13, Ohio

Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. ● Mines Eng. & Eqpt. Co., San Francisco 4, Calif. ● Interstate Equipment Co., Statesville, N. C. ● Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. ● Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

K+E
K+E NEWS
-by don herold-


"PAL, YOU AND I HAVE BEEN BUDDIES ALL MY ENGINEERING LIFE!"
ENGINEER

Down through the years with a K&E Slide Rule

Although K&E Slide Rules are the oldest slide rules made in America, there are no whiskers on 'em—except cat's whiskers (I mean, symbolizing precision).

If you are an old engineer, you probably regard your K&E Slide Rule as a priceless Stradivarius. You are probably figuring on passing it down to your grandchildren.

If you are a beginner, the sooner you attach yourself to an immortal K&E rule, the better.

K&E Slide Rules have become accepted symbols of the engineering profession. If a photographer, illustrator or cartoonist wants to indicate that his hero is a top-flight engineer, he puts a K&E Slide Rule in his hand or in the immediate environment.

Ask anybody what he knows about Keuffel & Esser, and he first starts rhapsodizing about slide rules. Slide rules and K&E are synonymous.

And they're both almost as long lasting as the pyramids!

Keuffel & Esser have been around since 1867 and they completed their first batch of slide rules in 1891.

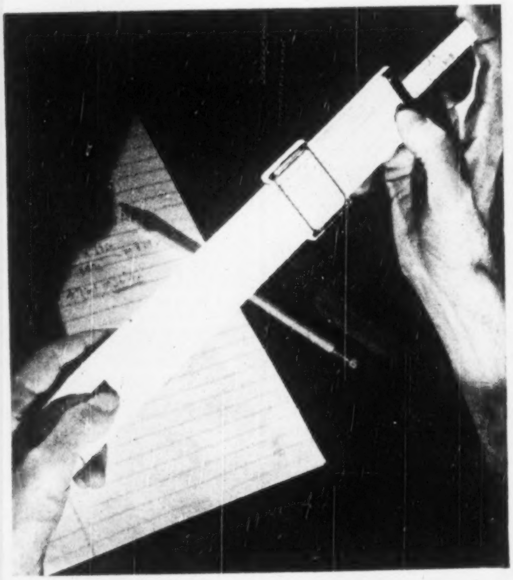
It is not uncommon to hear of a K&E rule which has been in service for over 50 years.

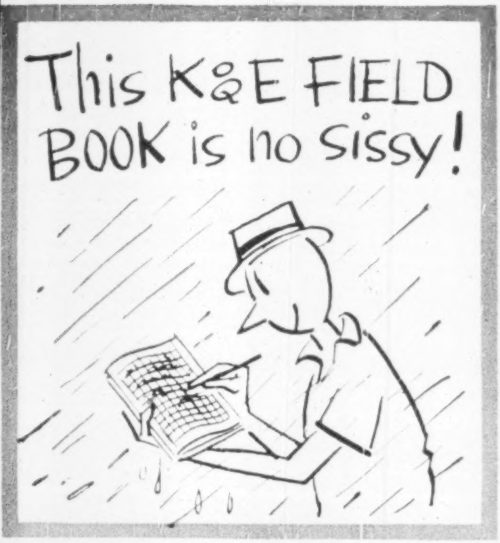
I used to think a slide rule was a slide rule—just as a yard stick is a yard stick—but there is a sensational variety of 'em in the K&E line—from the simple Mannheim to the more complicated brethren, such as the Log Log Duplex Trig and Decitrig and the Log Log Duplex Vector*.

Also, there are several sizes from the handy pocket rules, to the more common 10-inch, up to the 20-inch longfellows.

There's no point to hitching up for life with a "second best" slide rule when you can play a Keuffel & Esser.

*Trade Marks ®



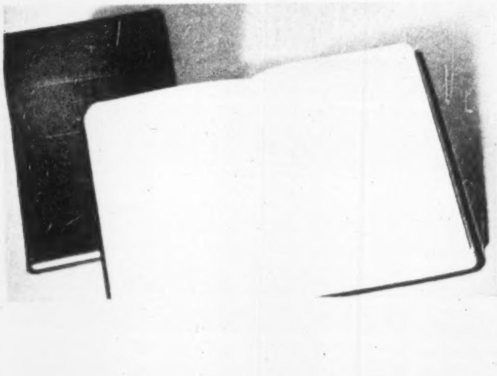

This K&E FIELD BOOK is no sissy!

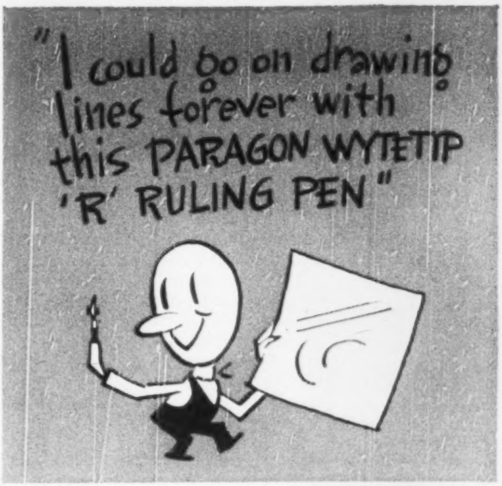
Out where men are men, and FIELD BOOKS had better be tough

K&E Engineers' Field Books are built to take a beating. They are constructed to withstand rain, snow and perspiration—and a rough life in a man's hip or side pocket—and back-breaking acrobatics in everyday life.

You can fold one of 'em backwards, cover to cover, for easier writing, and nothing will crack. The sections are stitched with rustproof wire to the tough canvas backbone.

The paper is either 100% or 50% clean white rag stock with a waterproofed surface. Both are very strong, give you an excellent writing surface and will not turn yellow or brittle with time. These books are usually referred to over and over again for many years. The rulings are printed in waterproof ink which will not blur with moisture. Yes, a K&E Field Book is made to be an engineer's pal in his rigorous outdoor life.




"I could go on drawing lines forever with this PARAGON WYTETIP 'R' RULING PEN"

You lucky engineers—with K&E ruling pens!

In my business as a cartoonist, all I have to play with is a 5-cent stub pen. But you engineers can enjoy a fine, precise, beautiful little surgical instrument when you have nothing more to draw than a straight or curved line.

I could drool several paragraphs over a K&E PARAGON* WYTETIP "R" RULING PEN. But space limits me to a few of the things that make it unique. It has points of high-speed steel butt-welded to blades of stainless steel. This makes it a real metallurgical masterpiece!

The high-speed steel points will wear almost indefinitely—which means that the WYTETIP "R" practically never needs resharpening. The stainless steel blades defy corrosion and give the pen eternal spring and resistance.

You can tell it on any drafting table by its smart black handle and distinctive white tip. *Trade Mark ®

K+E
partners in creating
For 83 years K&E equipment and materials have been partners of the draftsman, engineer and scientist in shaping the modern world

KEUFFEL & ESSER CO.
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NEW YORK • HOBOKEN, N. J.
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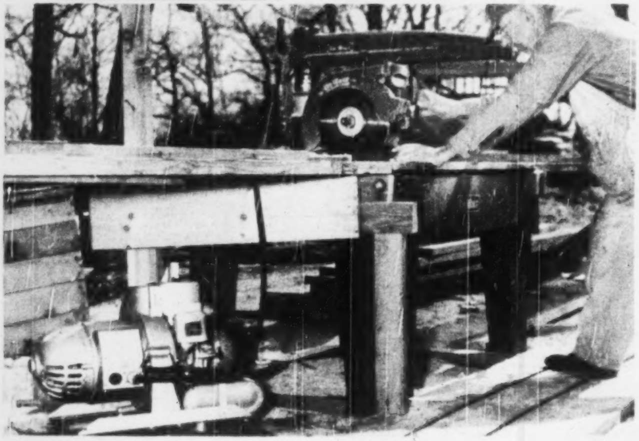
LOS ANGELES • MONTREAL

You Need All Three...You Get All Three

1. PERFORMANCE, 2. DEPENDABILITY, 3. SERVICE

HOMELITE *Carryable* GENERATOR



1. Performance. True, a Homelite Gasoline Engine Driven Generator is light enough for one man to pick up and carry but its performance is big enough to operate all your electric hand tools. In fact, it gives you power plus . . . power plus a large overload capacity . . . power plus a constant voltage under all loads . . . power that isn't sapped by long dangerous cables. Easy to get on the job; quick to start at all times, never bothered by extreme temperatures, a Homelite will keep your power tools going at peak efficiency always. It will save time and money for you on all jobs. Ask for free demonstration and see for yourself.

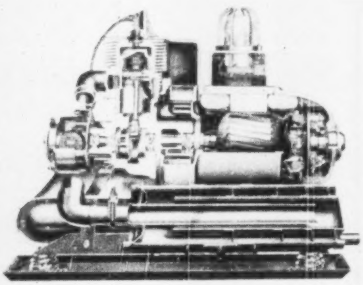
STICK TO THE RULE OF THREE 1. Performance 2. Dependability 3. Service — and you'll always stick to a Homelite

PERFORMANCE DEPENDABILITY

HOMELITE
CORPORATION

SERVICE 1108 RIVERDALE AVENUE PORT CHESTER NEW YORK

MANUFACTURERS OF HOMELITE CARRYABLE PUMPS • GENERATORS • BLOWERS • CHAIN SAWS • PAVING BREAKERS



2. Dependability. For more than 25 years, Homelite engineers have specialized in building carryable gasoline engine driven units. Their experience in building close to three hundred thousand of these units has been responsible for the simplicity of design and precision construction with finest materials that insure long-haul dependability and lowest maintenance costs.

HOMELITE
SERVICE

3. Service. A Homelite seldom needs service, but when it does, there's a trained Homelite service man near you . . . a man who will drive his truck right out to your job and put your Homelite in perfect operating condition. This prompt, competent service is a great money saving factor for those who want to get continuous production out of their power tools.

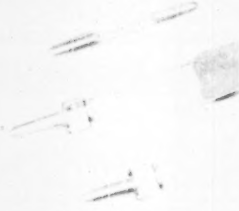
arrangements for a variety of end products.—Detroit Diesel Engine Div., General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich.

Elevator Buckets

Hi-Cap elevator buckets are intended for use with any powdered or granular free-flowing material which is not excessively abrasive. They can be used at high, medium or low speeds and are suitable for replacement purposes or new installations in chain or belt elevators. Body shape provides for maximum load and quick discharge at varying speeds.—Fort Worth Steel & Machinery Co., 3600 McCart, Fort Worth, Tex.

Abrasive Floor Aggegate

Non-slip floor surface is achieved by imbedding Bondelox particles into cement or asphalt floors. Bondelox is produced by crushing blocks of casting-alloy fused aluminum oxide, and then screening into standard sizes. Bondelox is blue-gray in color.—Metals Recovery Co., Ann Arbor, Mich.



Automatic Splices, Deadends

Holding power of automatic type splices (Strandlinks) and deadends (Strandvises) is said to exceed ultimate strength of standard steel strand and wire rope. They are available in sizes for ¼- and ⅜-in. steel-strand messenger, static, and guy wires. Gripping jaws are composed of case-hardened steel teeth.—Reliable Electric Co., 3145 Carroll Ave., Chicago 12, Ill.

Dry-Wall Primer-Sealer

Pigmented wall primer-sealer is recommended for painting dry-wall construction. Designed for interior walls of plaster and masonry or composition wallboard, it seals porous surfaces in one application. It provides firm adhesion and controlled penetration, making a single coat of sealer sufficient for even highly porous surfaces. It

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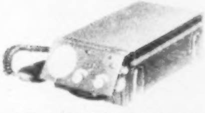

The Best in 2-WAY RADIO

CHALKS UP NEW GAINS IN THE UTILITIES FIELD

cutting time and costs of material and crew handling.

No half-way measures will do—not when you can have Motorola's EIGHT new advances in 2-way radio performance.

Take the new "UNI-CHANNEL" mobile Dispatcher. It has the marvelous SENSICON circuit with *permanent selectivity* and improved voice dominance over noise. It fits easily into the cab or trunk of any vehicle—with fixed-performance superiority over anything in its price class—and it's an excellent investment, *fully protected against future obsolescence!*

Specify Motorola—Get The Best!

The high standards of engineering excellence, set by the world leaders in 2-way mobile radio, is built into all MOTOROLA equipment. Remember when you buy Motorola, *you'll be paying actually less for the greater value included!*

New "UNI-CHANNEL" complete mobile, dash mount.

Complete Radio Communication Systems for Industry

COMMUNICATIONS & ELECTRONICS DIV **Motorola**

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"Gunite" .... the sand-cement product of the "CEMENT GUN," for Concrete and Masonry Repairs, Pre-Stressed Tanks, Steel Encasement and for lining Reservoirs, Sewers and Tunnels.

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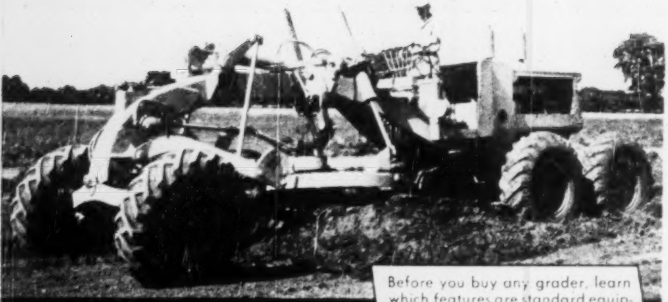
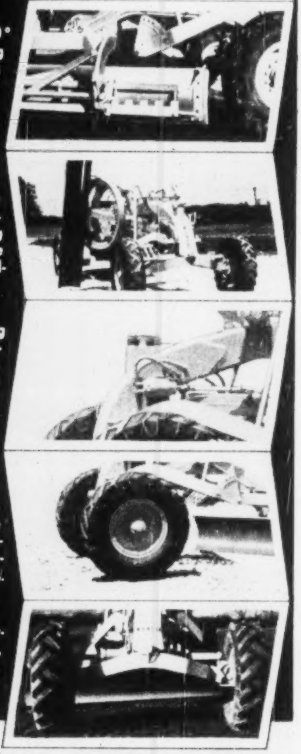
MANUFACTURERS OF THE "CEMENT GUN"





Before you buy any grader, learn which features are standard equipment and which ones cost you EXTRA. ONLY WARCO OFFERS THIS COMBINATION OF WORKING ADVANTAGES AS STANDARD EQUIPMENT AT NO EXTRA COST.

only the WARCO® combines all these EXTRA ADVANTAGES

at no extra cost

Blade revolves 360° without removing scarifier or teeth . . . big time-saver on the job.

Without leaving cab, operator can obtain extreme blade positions, including 90° cutting angles on either side . . . reduces "deadheading" time.

Mechanical steering with hydraulic booster . . . easiest steering, yet WARCO never leaves you stranded.

Same big-size tires all around and all wheels interchangeable . . . complete standardization requires minimum investment in spares.

30" front axle clearance on 100 H. P., 29" on 76 H. P. . . . straddles bigger windrows.

Other important advantages included in this unique WARCO combination:
- Exceptional operator comfort and visibility
- Instant response to positive hydraulic controls
- Extra working clearances

When you buy, put your grader dollars where they will buy the most . . . invest in a WARCO. Ask your distributor to demonstrate.

WARCO 100 H. P. Heavy Duty Motor Grader. . . .Model No. 4D-100
WARCO 76 H. P. General Duty Motor Grader. . . .Model No. 4D-76

W. A. RIDDELL CORP., BUCYRUS, OHIO

BUILDERS OF WARCO MOTOR GRADERS • HERCULES ROAD ROLLERS

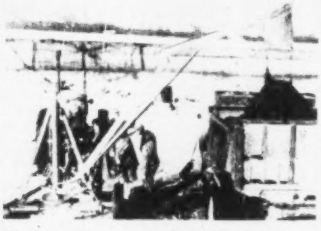
permits deep-tone flat colors without cloudiness or the appearance of shiners over patched joints.—Devoe & Raynolds, Inc., Home Decorating Institute, Room 1025, 420 Lexington, New York 17, N. Y.

Aerial Revolving Ladder

Hydraulic aerial revolving ladder can be positioned at any point in an 85-deg arc and rotated through a 360-deg circle. It reaches 55 ft into the air. Power is supplied by a power take-off mounted on the chassis transmission. Ladder fly section is extended manually. Ladder goes on ton and a half chassis, or heavier, dual rear wheels.—The American Coach & Body Co., 9503 Woodland Ave., Cleveland 4, Ohio.

Silicone-Insulated Welder

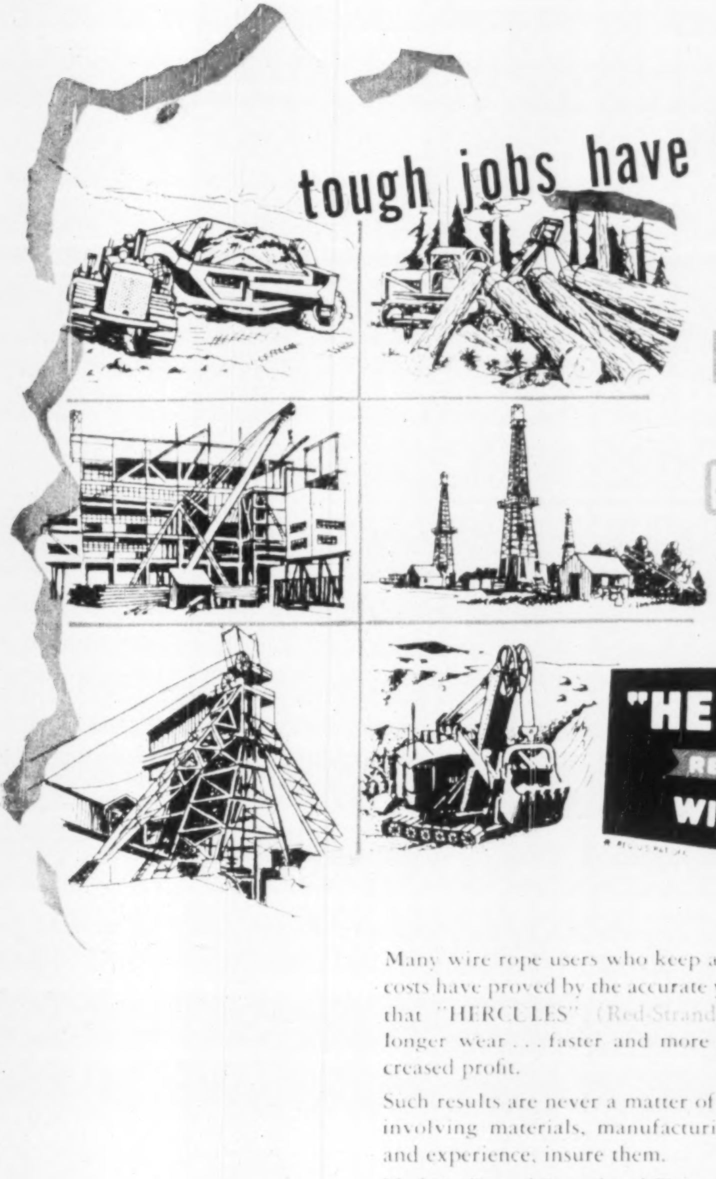
Portable ac welder features silicone insulation for high margin of safety and operating dependability. The 6WK20H measures 12x17x23 in. and weighs 154 lb. Current range is 30 to 250 amps. Welder is easily transported in an automobile trunk. Ampere range is covered by three overlapping current ranges which permit precise current control. Standard model operates on 220 volts, with a 440-v model available.—General Electric Co., Apparatus News Bureau, Schenectady 5, N. Y.



Trailer-Type Digger, Shovel

Hopto digger-shovel features 180-deg swing and a wide variety of shovel equipment. Hopto attaches to power take-off of any tractor, Jeep, or truck.

(Continued on page 109)



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Many wire rope users who keep an eye on their operating costs have proved by the accurate yardstick of performance that "HERCULES" (Red-Strand) Wire Rope provides longer wear . . . faster and more *continuous* work . . . increased profit.

Such results are never a matter of chance; definite policies involving materials, manufacturing methods, equipment and experience, insure them.

Made in Round Strand and Flattened Strand constructions, Preformed or Non-Preformed; there is a correct type for every purpose.

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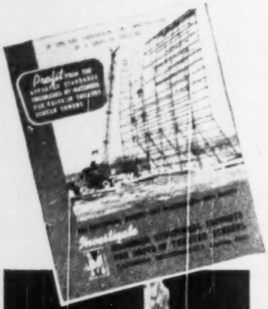
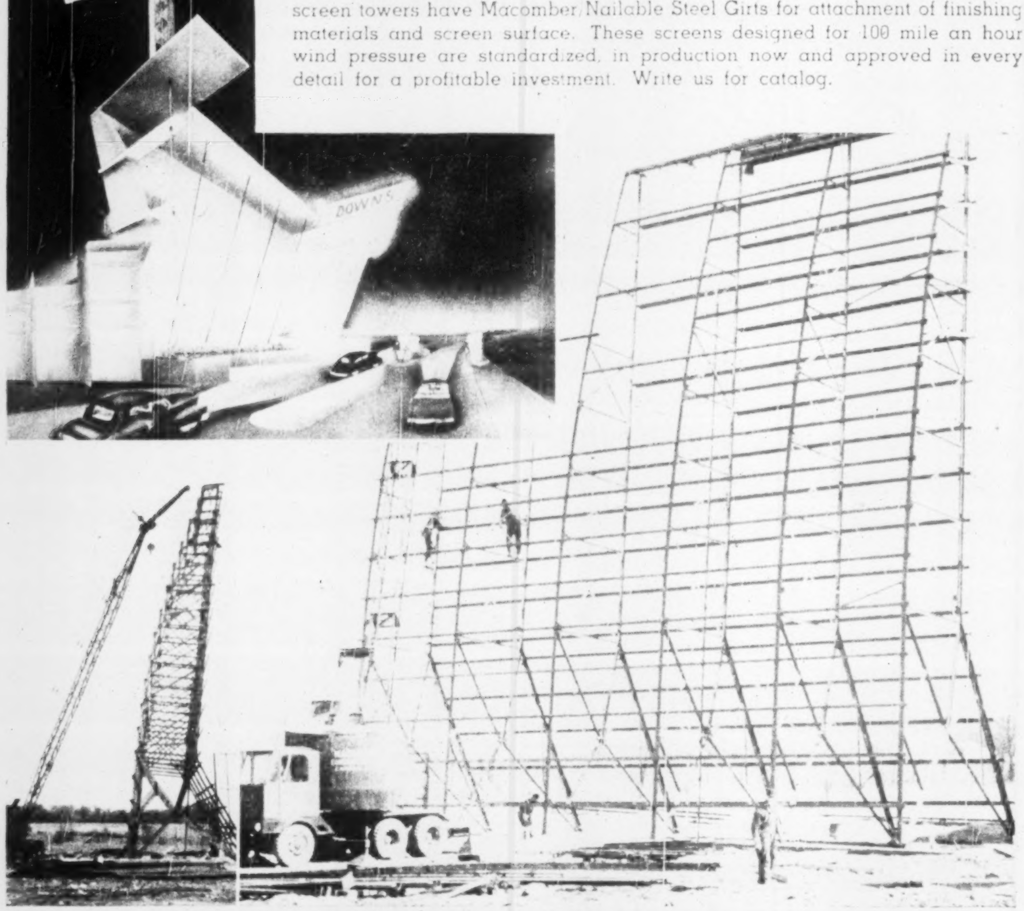


You'll Want This Latest Information ON DRIVE-IN THEATRE FRAMING

The catalog on the left shows the details of the two types of Macomber Drive-In Theatre Screen Supports engineered, fabricated and erected in accordance with state authority groups who approve this type of structure. The one shown is a modified Bowstring frame with sloping front for a low projection angle. The other type is an "A" Frame design with vertical screen where projection booth is elevated midway up amphitheatre layout. Frames are made in two sizes for medium and large layouts. All four sides of these screen towers have Macomber Nailable Steel Girts for attachment of finishing materials and screen surface. These screens designed for 100 mile an hour wind pressure are standardized, in production now and approved in every detail for a profitable investment. Write us for catalog.



STANDARDIZED STEEL BUILDING PRODUCTS

SERVICE IN STEEL CONSTRUCTION STANDARDIZED MACOMBER CANTON OHIO

MACOMBER · INCORPORATED

CANTON, OHIO

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Powered by a 10,000-lb hydraulic jack, the Porter metal post straightener operates in any position. The jack has a full-swiveling handle to permit pumping at the most convenient angle. Lever-operated valve provides quick, easy control.—H. K. Porter Co., Inc., Somerville, Mass.

New Product Briefs

Hard-facing alloys with a-c deposit ratings are announced by Stoody. These electrodes, formerly limited to d-c application only, are Stoodite, Tube Borium, and Borod. The company will continue to produce the original d-c electrodes.

Fluorescent lighting fixtures announced by Sylvania include an 8-ft 2-lamp 75-watt unit for continuous-row lighting and a 96-in. 4-lamp 75-watt shielded slimline fixture.

Socket wrench set ½-in. square drive, has been redesigned to provide greater working efficiency and stylized appearance. Manufactured by Snap-on Tools Corp., Kenosha, Wis.

Fire extinguisher of the soda-acid type features removable discharge elbow, extra-dimensional inner screen with more non-clogging surface, and 500-lb test seamless shell. Manufactured by Stop-Fire, Inc., Brooklyn 1, N. Y.

Wall-heating unit is manufactured in 25,000 and 45,000 Btu sizes. Heater and case fit between standard 16-in. on-center studs. Manufactured by Royal Heaters, Inc., Alhambra, Calif.

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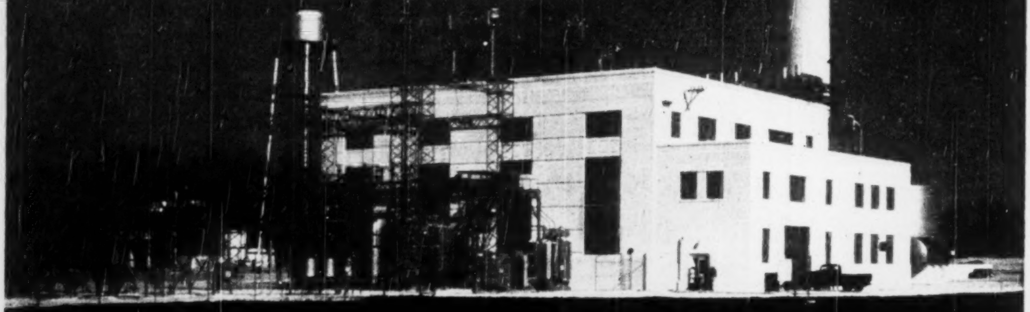

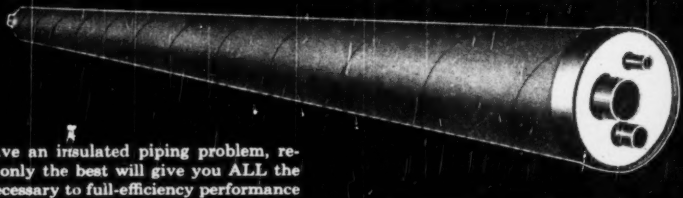

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Manufacturers' Publications

Dehumidification Equipment—Facts concerning dehumidification are listed in non-technical language in this folder. It describes the various factors concerned, and lists methods for removing moisture from air. Features of the Abbeon dehumidifiers are explained by text and cutaway view.—ABBEON SUPPLY CO., 58-10 41st DRIVE, WOODSIDE, NEW YORK, N. Y.

Tubular-Steel Scaffold—The Advance line of tubular-steel scaffold is illustrated and described in Folder A6. Included are descriptions of patented self-contained cam locks for instantly attaching cross braces to panels, and the stack lock for locking panels together vertically. Various types of standard panels are illustrated.—BEAVER ART METAL CORP., ADVANCE SCAFFOLD DIV., 1258 FACTORY AVE., ELLWOOD CITY, PA.

Metal Lath and Plaster—Use of metal lath and plaster in residential and commercial construction is depicted in a 16-p booklet. This non-technical booklet is designed primarily to acquaint home builders with advantages provided by the monolithic construction resulting from the combination of metal lath and plaster for walls and ceilings. It describes various types of lath and plastering accessories. Nine specific advantages are described and pictured.—METAL LATH MANUFACTURERS ASSN., 1376 ENGINEERS BLDG., CLEVELAND 14, OHIO.

Asphalt Plant—Bulletin describes Model 101 bituminous plant. The plant has a rated capacity of 135 tons per hour. Bulletin explains the portability, production, and performance built into the plant and illustrates by means of a 3-p cutaway view how material flows through the plant in a continuous process. The Continuflo plant has three main units, all mounted on pneumatic tires.—PIONEER ENGINEERING WORKS, INC., 1515 CENTRAL AVE., MINNEAPOLIS 13, MINN.

Portable Electric Tools—Catalog 50A illustrates and describes complete line of Hi-Power and Zephyr portable electric tools. These tools include drills, hand saws, paint sprayers, paint brush cleaners, and drill kits. Complete specifications are listed for each unit.—PORTABLE ELECTRIC TOOLS, INC., 320 W. 83RD ST., CHICAGO 20, ILL.

ADVERTISERS IN THIS ISSUE

Adams Mfg. Co., J. D. 8
Aetna Casualty & Surety Co., The 12
Allied Steel Products Corp. 81
Aluminum Co. of America 9
American Surety Co. 76
Austin-Western Co. 58

Bethlehem Steel Co. 1
Blaw-Knox Div., Blaw-Knox Co. 16

Cement Gun Company 105
Commercial Shearing & Stamping Co. 85
Cummins Engine Co. 15

Davenport Locomotive Works 78
David House Moving Co., E. F. 78
Dodge Div., Chrysler Corp. 46
Dow Chemical Company 62

Euclid Road Machinery Co. 11

Fairbanks Morse & Co. 85
Firestone Tire & Rubber Co. 51
Flexible Steel Lacing Co. 84
Foote Co., Div. Blaw-Knox Co. 45
Ford Motor Co. 4th Cover
Fort Pitt Bridge Works 89

Galion Allsteel Body Cement 58
General Electric Company 2nd Cover
General Motors Truck Div., General Motors Corp. 70, 71
Gilson Screen Company 47
Grasselli Chemicals Department, E. I. du Pont de Nemours & Company, Inc. 10
Gunite Concrete & Construction Co. 76
Gunite Florida Service, Inc. 75
Gurley, W. & L. E. 54

Harnischfeger Corporation 20
Hewitt-Robins Corp. 54
Homelite Corp. 104
Horn Co., Inc., A. C. 3

Indiana Gunite & Construction Co., Inc. 86
Irving Subway Grating Co. 85

Jones & Laughlin Steel Corp. 67
Joy Mfg. Co. 75

Kearney & Mattison Co. 77
Keuffel & Esser Co. 102, 103
Koehring Co., The 4, 5

Layne & Bowler, Inc. 53
Leschen & Sons Rope Co., A. 101
LeTourneau, Inc., R. G. 17
Lima Shovel & Crane Div., Hamilton Corp. 52

Mack Trucks, Inc. 7
Macomber, Inc. 108
Mall Tool Co. 5
Monsanto Chemical Co. 13
[illegible] Corp. 44
Motorola, Inc. 107

National Clay Pipe Mfrs., Inc. 87

Owen Bucket Company 75

Permutit Co., The 6
Phoenix Bridge Company 88

Raymond Concrete Pile Co. 3rd Cover
Republic Steel Corp. 27
Rex-Wil Company 51
Riddell Corp., W. A. 68
Rockford Clutch Div., Borg-Warner 55
Rogers Bros. Corp. 105

Seaman Motors 78
Smith Engineering Works 101
Smith Co., S. Morgan 58
Sprague & Henwood, Inc. 86
Stewart Iron Works Co. 100

Trailer Village, Inc. 75
Twin Disc Clutch Co. 74

Union Metal Mfg. Co. 23
U. S. Rubber Co. 10
Universal Concrete Pipe Co. 81

Wallace & Tiernan Co., Inc. 18
Weinman Pump Mfg. Co. 53
Western Waterproofing Company 42
Westinghouse Electric Corp. 56, 57
Wild Surveying Instruments of America, Inc., Henry 2

Yeomans Brothers Co. 60

Professional Services 99

SEARCHLIGHT SECTION

(*Classified Advertising*)

EMPLOYMENT
Positions Vacant 92
Civil Service 92
Positions Wanted 92, 93
Part Time Work 93
Selling Opportunities Wanted 93
Employment Agencies 92

SPECIAL SERVICES
Contract Work 93

BUSINESS OPPORTUNITIES
Offered 93

NOTICES
Proposal 87-91

PROPERTY
For Sale 93

EQUIPMENT
(Used or Surplus New)
For Rent 96
For Sale 93-97
Piling 96
Pipe 96
Rail 96
Surveying Instruments 94

WANTED
Equipment 93

ENGINEERING NEWS-RECORD

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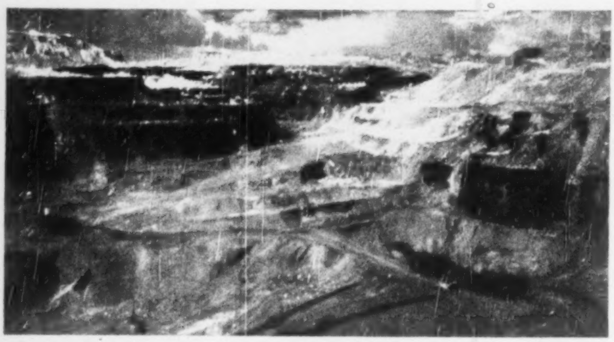
Sales Representatives: [illegible]



Taconite Means: More Steel, More Construction

Taconite is the low-grade mother rock of rich Mesabi Range iron ore. The Lake Superior mining area abounds with it. Its 25-30% iron is finely disseminated and not easily separated. But separated it will be, for taconite, despite new and rich ore fields to be developed in Labrador and Venezuela, figures as a major source of tomorrow's steel.

As the 1.6 billion tons of shipping ore have been dug from Mesabi's vast pits over the past 57 years, taconite literally has been thrown over the banks, piled in some places, left untouched in others. Now, with maybe another 1.7 billion tons of good ore left—a supply estimated to last anywhere from 20 to 40 years for shippers with the largest holdings—the steel industry is getting more and more serious about processing taconite to get ore out of it.

Already some $25,000,000 has been spent by the steel companies on taconite research and development. A 200,000-ton (per year) pilot plant has been in operation for over two years and a 2,500,000-ton plant is planned at a cost of about $50,000,000. An RFC loan to finance it looks quite likely under the initial war mobilization bill now before Congress.

• Not Cheap—A lot of money will be spent on construction before all the problems of taconite beneficiation have been solved. Then the dollars will really have to be poured in to make the process pay.

Three tons of taconite must be mined and processed to produce one ton of usable product. The only way to lick this apparent inefficiency is, in the opinion of mining men, to work on a tremendously large scale. The operation must be large if beneficiated taconite ore is to compete in the market with easily mined high grade ores. It's an all or nothing affair.

Initial investments for construction and tooling are estimated along these lines: The smallest economical plant would produce 2,500,000 tons per year and cost almost $50,000,000 to build. Larger installations would be proportionate. It is conceivable that taconite beneficiation plant enough to produce 25,000,000 tons per year might mean spending of half a billion construction dollars.

• Not Far Off—How likely is this—the eventual production of 25,000,000 tons of ore each year from taconite?

Right now it looks quite likely. Mesabi, where 85% of the nation's iron is mined, can't last forever, but it is thought there might be taconite enough there to double the area's remaining productive life.

One thing is sure: Some new source of ore must be found, and soon, to stave off the day when Mesabi peters out. Perhaps the best place the U. S. can conserve ore for future use is in the ground. Every ton of ore left untouched in the nation's mines is a ton saved for a rainy wartime day.

Where, then, is the ore to come from if rich domestic ores are to be conserved? From abroad?

Much is heard of recent finds of high-grade ores in the Quebec-Labrador field and in Venezuela. At least 350 million tons of ore (higher grade than Mesabi) await mining in Canada. But even after it is brought down to the St. Lawrence, the Pittsburgh-Youngstown furnaces are inaccessible by water without a St. Lawrence seaway, and Baltimore is 1,200 seamiles away.

In comparing costs of ores it's not what you mine them for that counts; it's what you can sell them for in the Pittsburgh area. And distance makes the price grow higher.

In Venezuela a billion tons of rich ore await exploitation. Production down there could reach 10,000,000 tons per year by 1955. But, here again is a transport problem: a long trek to water, then a 2,500-mi. sail to East Coast furnaces.

And the sail, this time, is across open water—waters open to enemy submarine action in wartime. This same unfortunate circumstance weighs heavily upon thinking throughout the steel industry on other foreign ore sources—Chile, Liberia, Brazil, North Africa.

• Not Easy—So thoughts return to Mesabi, where new transportation problems are nil, to taconite with its processing difficulties but bountiful supply.

The bugs are being taken out of the process. Fundamentally, it's one of crushing, grinding, separating and pelletizing. The taconite gets three crushings, then fine grinding gets it down to minus 200-mesh size; magnetic (or other) separation takes the iron mineral from the silica; the powdered ore then is agglomerated into pellets of a size that will ship easily, and not go up the blast furnace stack, or cut off its draft.

This last step in the process, agglomeration of the finely ground ore, is the one still needing refinement. Sintering (fusing into lumps) would require much hauling of coal and cost heavily; pelletizing has been substituted. This method rolls the powdered concentrate in a balling mill from which it emerges in $\frac{1}{2}$ to $1\frac{1}{2}$ in. dia. sizes to be baked to a hardness to withstand wear.

So the process is shaping up. And the day is approaching when the steel industry may have to tackle taconite full-scale. When that day comes there'll be a new market for construction. Until that day there is to be construction abroad for those who will tap the inland foreign sources with air strips, roads, railways and shipping piers.

While mines overseas are in favor, there are transport facilities to build. When attention really turns to taconite here at home, new plant will be much in demand. Either way the construction industry is a full-fledged partner in the present search for iron.

Raymond conquers *chubascos*...in

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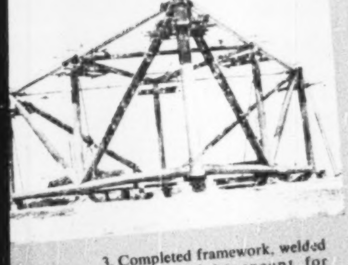
1. Construction of pipe frame float 30′ high, 80′ long on each side of the triangle.

2. Closer view of the starting framework, showing 22″ diameter steel pipe being used.

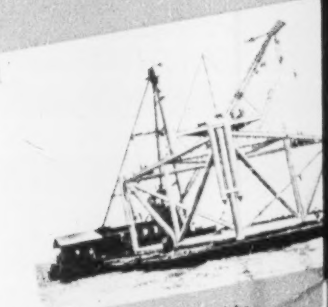


3. Completed framework, welded and watertight except for the corner verticals, which will accommodate anchor spuds.

The Problem: 250 foot Gow soil borings, accurately spotted five to ten miles offshore in the deep waters of Lake Maracaibo, Venezuela. The Project: pile foundations for future oil well derricks. Special Hazard: 70-mile-an-hour "chubascos"—violent squalls that would wreck temporary platforms.

The Solution: Raymond engineers designed a triangular *floating* platform of 22″ steel pipe welded and watertight. The three corner members were left open for 120-foot-long anchor spuds. Assembled on shore from steelwork fabricated in New York, the 60-ton float was skidded onto two barges and towed 32 miles to the first boring location where floating derricks launched it. Spuds and deck equipment were placed later, including winch-controlled anchors at each corner to help in spotting the float and holding it steady during boring operations.

The Moral: When the problem is tough, the answer must still be *right*. That's when it pays to have a resourceful, experienced organization on the job . . . like Raymond!



4. Floating derricks preparing to lift the float from barges and place it in the water.

5. Launching the 60-ton float. Note work platform erected 10 feet above framework.

6. Float in position for Gow boring operations, anchored by the 120′ spuds and cables at each corner.

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